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\*Illustrated.

THAT was a very interesting and suggestive paper which

E. B. Leigh, president of the Chicago Railway Equipment Co., read at the annual meeting of the Railway Business Association last week. Mr. Leigh's paper, which deals with the relationship between railway purchases and the general business situation, is given elsewhere in this issue of the *Railway Age Gazette*. Of course, while railway purchases are affecting general business, general business also is affecting the amount of railway purchases; but that, as Mr. Leigh points out, the volume of railway purchases produces a marked and great effect on general business conditions, cannot, it would seem, be questioned. If, therefore, owing to artificial causes, rather than normal economic forces, railway purchases are restricted, the inevitable result must be to reduce business activity and the general prosperity. Now, conditions which are chiefly artificial have for some years prevented railway rates from advancing along with the prices of commodities and the wages of labor. During the same period there has been, as Mr. Leigh pointed out, a marked slowing up in railway purchases. This slowing up has characterized not only purchases for current maintenance and operation of existing roads, but also purchases of materials and supplies to be used in new construction. Likewise, there has persisted during this period, with occasional breaks, a serious business depression. There may be differences of opinion as to the exact extent to which the restriction of railway purchases has affected general business; but that it has produced a real and very substantial effect, the statements of fact and reasoning in Mr. Leigh's very interesting paper seem clearly to establish.

IF there still remain a few thoughtful people who cling to the belief that the Interstate Commerce Commission's duties and dignity are judicial as well as administrative, their sense of fitness probably received a rather rude shock when they read Commissioner Prouty's address before the Lotos Club of New York, in which he not only discussed very frankly the merits of a question which is now before the commission to decide on, but, possibly unintentionally, put himself on record as to how that question should be decided. This is all legitimate enough if the commission's duties are viewed as simply administrative and legislative. There is no violation of ethics for a congressman to express his views in the most emphatic manner in regard to pending legislation, and if the commission is nothing more than a branch of Congress, with special administrative duties which give it extraordinary power, it is quite seemly that an individual commissioner express his individual views, although these views may or may not coincide with the final views of the commission as expressed in its formal opinion. As to the emphatic opinion which Commissioner Prouty expressed, that he would not permit an increase in rates unless he were assured in some way that the money so received would be spent for legitimate railroad purposes, Commissioner Prouty follows the trend of the times in believing that men can be legislated into being honest. It would be rather interesting to know whether Commissioner Prouty, if he had been acting as an arbitrator in the trainmen's demands for higher wages, would, after having decided that the cost of living had increased 7 per cent., have withheld this 7 per cent. additional pay from the men unless they could have given him some guarantee that the money so received would not be spent either on unlawful or unethical pleasure. The Hadley Securities Commission recommended that the federal government assume at least sufficient supervision over the issue of new securities by railroad companies to assure full publicity to the purposes for which new securities are issued by railroad companies. But ought this entirely praiseworthy and correct principle to be lugged in and used as a "trade" for an increase in rates?

IT is a curious fact that one thing which has contributed probably more than anything else to the present Boston & Maine situation is that its fixed charges have grown out of all proportion to the margin of safety represented by the investment

of the owners—the stockholders, and that this is the result of the Massachusetts law regulating the issuance of railroad securities. The reason that it was not operative in the case of the New Haven is because the New Haven refused to comply with the Massachusetts law on the ground that it was a Connecticut corporation. The Massachusetts law provides that new stock can be sold to stockholders only at the market value. In other words, if Boston & Maine stock was selling at 140, as it once was, stockholders could not be offered the privilege of subscribing for new stock at 125 or 130, but could buy new stock only at 140. There was, therefore, absolutely no incentive for the owners to raise new capital in this way; in fact it is a very simple proposition that they would be averaging down the value of the stock then held by the issue of additional stock. They, therefore, preferred to get money by borrowing it; namely, to issue bonds which because of the company's then high credit could be sold on very favorable terms. No matter how gilt-edged a stock may be, a stockholder takes the risk, should assume the responsibility and should have the chance of increased profit that belongs to the owner. This fundamental economic fact the Massachusetts law failed to recognize. Shortsighted management may have contributed materially to the present deplorable condition of the Boston & Maine, and real responsibility rests on those who sold Boston & Maine stock to their clients and then failed to do all in their power to live up to the responsibility of protecting their clients' interests; but, on the other hand, the Boston & Maine situation is a rather terrible object lesson of the danger of inexpert regulation of the issuance of securities.

**A**T Shepherd's Bush, on the Central London (underground) Railway, September 30, a signalman caused a rear collision of eastbound passenger trains by a remarkable series of blunders, which Major Pringle, the Board of Trade inspector, describes as "incautious and stupid misuse of electric locking apparatus." This apparatus was Spagnoletti's "lock and block." The collision was not violent, and the story is too long to be repeated here; but the main points may be noted, as an illustration of how it frequently develops that safeguards must themselves be safeguarded. This signalman had been in the service 13 years, and at this post seven months. He had, on the eastbound track, an outer home signal *B* and an inner home signal *C* which, with the starting signal at the station in the rear *A* he had to unlock successively for each train, the locks being first released by the passage of the preceding train over treadles. With these two signals, *B* and *C*, he virtually controlled two blocks, instead of one. His first mistake was to put to the stop position, both *B* and *C*, when the train which he ought to have protected had only passed *B*. Trying to unlock *A* for the next train he discovered his mistake. Then, without learning the position of the first train he hastily concluded that he must clear *C* for it (though its engine had passed *C*) and he went to his emergency release (which he got at by breaking a paper cover); but he went to the wrong one; he released signal *B* instead of *C*. And then, not discovering his mistake, he cleared signal *B*, instead of *C* as he had purposed. The trains had left the preceding station only two or three minutes apart, and the collision soon followed. In a month more the company would have had installed here automatic signals, with track circuits; and so Major Pringle's only comment is that "lock and block working in itself does not afford the security necessary for this kind of traffic." Nor for any kind, he might have said, if emergency releases are to be such an easy resource. Any American signal engineer could have told Mr. Spagnoletti that a time lock should have been used, along with the breakable paper cover. However, as track circuits have been adopted, this question need not be discussed. (Discussion would compel the admission that the perverse human brain will even circumvent time locks.) And, again, some would say that the most significant passage in Major Pringle's report is that which tells us that these emergency releases have

been used at Shepherd's Bush "not infrequently," because the treadles did not perform their function.

**T**HE statement that in one month more track circuits would have been put in use on this part of the Central London puts the Shepherd's Bush collision in the same class with three other recent cases: Melun, on the Paris, Lyons & Mediterranean; College Point, on the Long Island; and North Haven, on the New York, New Haven & Hartford. Each of these roads had begun improvements designed to prevent collisions, but had not finished them. The "P. L. M." had ordered cab signals; the Long Island had ordered the manual block system, to take the place of a mongrel system; and the New Haven road had ordered distant signals where enginemen had been trying to make time without them. Other cases of this kind could be recalled. When a railroad manager decides that a certain investment in safety measures shall be applied at the place where the need is greatest, he exercises a delicate responsibility. If only it had been possible to divine where the next failure in the use or observance of signals would occur, provision could have been made against that failure. The chance of correctly estimating is, however, utterly elusive. Collisions are not only exceedingly rare, when compared with train mileage, but they are very few in proportion to the number of cases of error or neglect which might cause a collision. Good luck seems to save us, very often. The railroad manager, logically, can do nothing but strive for perfect safety at all times and in all places. He must remember the old dictum that "danger lurks in every foot of a railroad." For an expenditure which it is deemed the absolute duty of the company to make, directors will freely and definitely authorize financial provision many months, or years, beforehand. Signaling improvements have not always been thus dealt with because they have not been classed as absolutely necessary. But are they not rapidly coming to be looked upon as belonging to that class? Is it not right that they should be thus treated? How long before some other road will have to answer to the public the same as the P. L. M. now has to answer?

**L**AST week we called attention to the fact that mere words—lectures, personal admonition, circulars or what not—constitute only a part of the means which must be adopted to accomplish a higher degree of safety in doing railroad work. But words have their place, and an important one; and it is instructive to examine the different examples, on different roads, of the way in which the safety-first idea finds expression. The fundamental thought is the same everywhere; but variety does aid in securing intelligent attention. We noticed recently a placard issued by the Grand Trunk, made conspicuous by being printed in three colors. The notices issued by the Northern Pacific, and copied in another column of this paper contain novel features. At the recent New York Central safety-first meeting in New York City Mr. Dow put numerous well known facts in striking phrases. For example: "Let us have inspectors of unsafe practices as well as of [unsafe] cars. . . . *There should be no custom or rule of friendship* to prevent your getting after the habitually careless fellow worker, or to forbid your reporting him where necessary. . . . The officers can give you advice, but they cannot give you your conduct." Mr. Bronson: "Discipline is one of the most unpleasant as well as unpopular duties of an officer. If I owned a railroad and could run it myself I would absolutely abolish suspension. We are trying to get along without it. It is up to you men to make that possible." In another column there is an interesting "safety-first" paragraph addressed to the parents of careless children. In striving for simplicity and directness it is just possible that one may go too far. At the Jersey City meeting, spoken of last week, one speaker illustrated this point by citing a bit of history, to the effect that "safety first" is not wholly a new idea. G. W. Barker, superintendent at Jersey City in the old days of the New Jersey



Railroad & Transportation Company, more than forty years ago, posted all around the yards and shops the notice quoted at the bottom of this paragraph; "and," said the speaker, "that notice stuck in our memories; for it took us some little time to learn what 'paramount' meant!" Who shall say that an unfamiliar word did not, in that case, produce good results? A lawyer, talking to a jury, must simplify to the last degree, because he has but that one chance to present to those men the ideas that he wishes to impress on them. But in addressing men in a campaign—a never-ending campaign—the process of simplification, if carried to extremes, may have a distinctly weakening influence. To introduce words which contain more meaning—and then to do what is necessary to arouse everybody to the duty of getting at that meaning—may be really educational. If a man can be induced simply to read over the synonyms of the word above referred to, the lecturer or instructor who accomplishes that much may fairly assume that he has made a distinct advance in his efforts to impress upon everybody the idea that

"SAFETY IS PARAMOUNT."

#### THE RATE ADVANCE CASE.

THE eastern railways deserve to be congratulated on the comprehensive and skilful presentation of their case for advances in freight rates which has been made to the Interstate Commerce Commission. The opening statements made by Daniel Willard and F. A. Delano, the financial and operating statistical data introduced, and, indeed, all the statements and testimony placed before the commission, have been clear and concise, pertinent and persuasive. The evidence seems clearly to have shown that capital expenditures, the return that must be made to capital, and operating expenses, especially the wages of labor, have been increasing so much faster than the earnings of the railways as to make conclusive and imperative the need for increases in rates.

The line of attack which the opponents of advances in rates will adopt is not yet known. Doubtless they will attack the unwise and wasteful financing which has been done by some roads. Doubtless they will try to show that either because of incapacity or dishonesty on the part of their officers some roads have not been as economically operated as they could and should have been. But while they doubtless can show that some individual roads have not been as well handled as they could have been and should have been, it may confidently be said that it can be shown that a very great majority of the roads in eastern territory have been managed honestly, prudently and skilfully. Now, the Interstate Commerce Commission in past decisions has said that in determining rate controversies it will not consider merely the situation of a few roads, but the general situation. If the commission follows that course in this case it is hard to see how it can deny the advance in rates sought or one equivalent to it.

Commissioner Prouty in a recent address has intimated that if the commission should let the roads advance their rates it might demand guarantees that the additional revenues would be honestly and wisely used. As to the propriety of this intimation we have spoken elsewhere. F. A. Delano in an interview in Chicago promptly answered that the roads would gladly give such guarantees. Just what kind of guarantees the commission might demand or the railways give is not entirely clear. It seems quite probable that what Mr. Prouty had in mind was that there should be legislation giving the Interstate Commerce Commission authority to regulate the issuance of railway securities. The results which would be caused by the adoption of legislation giving the commission such power are doubtful. What they would be, would of course, depend very largely on the extent of the power given and the way it was exercised. Unfortunately, while for many years the financing of most of the railways of the United States has been honest and conservative, there have been during this time railway managements that have not done their financing conservatively or, perhaps, even honestly. These exceptions to the general rule give great force in the minds

of the public and the regulating authorities to the argument for some kind of federal regulation of railway stocks and bonds.

It seems highly probable that measures for the regulation of railway securities will be vigorously pushed in Congress this winter, and that some such measure will be passed; and on the whole it seems likely that it will be better for the railways to co-operate with the Interstate Commerce Commission and the proper committees of Congress in framing legislation along this line than for them to oppose it altogether. In other words, if this is the form of guarantee which the commission wants, and to which Commissioner Prouty alluded, probably it will be most expedient for the railways to give it without overmuch murmuring or opposition. The question of railway financing is being connected up in the minds of the public and the regulating authorities with that of rate regulation. It is highly probable that in the long run some form of federal regulation of securities will be adopted. It is also highly probable that postponement of regulation of securities will postpone the adoption of a more reasonable policy of regulation of rates. It would seem, therefore, that on grounds of expediency, the argument for co-operation by the railways in the framing of some kind of legislation regulating the issuance of securities is persuasive.

#### THE CAUSES OF THE NEW HAVEN'S TROUBLES.

THE Chicago *Tribune* suggests that "about the worst tack capitalists and directors of capital can take at this time is to attempt to charge up the disaster which has befallen holders of New York, New Haven & Hartford and Boston & Maine railway shares to 'agitation,' to regulation, to 'anti-railroad legislation.' The disaster was the inevitable result of a collision between the inordinate ambition of a group of 'high financiers' and an awakened popular opinion in an uncommonly intelligent region of the world."

This statement is partly correct and partly incorrect. As to the New York, New Haven & Hartford, its troubles are due largely to its management under the Mellen regime. One of the management's mistakes was that it used the money and credit of the road to buy control of numerous properties at prices exceeding what they were, or are yet worth, either independently, or as feeders of the New Haven. The consequence has been that the New Haven has had to pay returns on the securities issued by it to acquire these properties which are larger than the returns, direct and indirect, which it has received from the properties. The effect, of course, has been to reduce the funds available for paying dividends to the stockholders of the New Haven.

Those who made these various deals displayed more ambition, or imagination, or optimism than business sagacity or regard for public opinion. Furthermore, evidence multiplies that the physical development and operation of the property were not carried on as skilfully and economically under Mr. Mellen's administration as they might have been. The stockholders had their responsibility for all this, because the property belonged to them, and it was to their interest and their duty to themselves and the public to use their votes and influence to cause it to be well managed. The directors, likewise, had their responsibility, for they were the men chosen by the stockholders to select the active managers and supervise their work. Finally, Mr. Mellen had his responsibility because he was the man chosen by the directors to be the executive manager of the property. As such he carried out the mandates of the directors either contrary to or in accordance with his own judgment. He says that the former was the case, and seems to think that by so saying he exculpates himself. But it is rather difficult to see how a man occupying an important fiduciary position reduces the blame attaching to unwise or improper conduct of his own by saying that he acted contrary to his own judgment. Men of true self-respect and true loyalty to the interests of those who employ them resign their jobs when attempts are made to compel them to adopt and carry out important policies contrary to their best judgment.

Meanwhile, the stockholders of the New Haven are paying dearly for the past unwise management of their property. Their dividend has been reduced step by step, and at last, at least temporarily, passed altogether.

The present situation of the New Haven is not, however, entirely, or anywhere near entirely, due to the conditions already alluded to. It is suffering from the same conditions from which most of the other railways of the country are suffering. Like them, while the legitimate and necessary investment in its property, and, therefore, the return which it legitimately should pay to capital, have been increasing, its operating expenses also have been increasing so much, owing chiefly to advances in wages, that the net earnings from which to pay return to capital have been declining. Furthermore, largely owing to the same causes, it is suffering from a decline in the net earnings of the companies which it controls. Last week Chairman Elliott gave out a detailed statement regarding the earnings and expenses of the New Haven and its controlled properties, for the first four months of the fiscal year 1912, and the first four months of the fiscal year 1913. The figures relating to the New Haven itself were as follows:

	Four months to October 31.	
	1913.	1912.
Operating revenue, including net results of outside operations .....	\$24,074,710.26	\$25,025,072.38
Operating expenses and taxes.....	17,434,300.99	15,923,557.52
Operating income .....	\$ 6,640,409.27	\$ 9,101,514.86
Other income .....	1,867,432.38	1,732,889.60
Gross income .....	\$ 8,507,841.65	\$10,834,404.46
Deductions—Interest, rentals, etc.....	7,120,962.00	6,295,409.06
Net corporate income.....	\$ 1,386,879.65	\$ 4,538,995.40

It will be seen that of the more than \$3,000,000 loss in net corporate income during these four months almost \$2,500,000 was due to a decline in operating income, and that of the decline in operating income about \$1,000,000 was due to a reduction in operating revenue, while over \$1,500,000 was due to an increase in operating expenses and taxes. On almost all the New England lines, likewise, there were both reductions in operating income and increases of operating expenses and taxes. While the public is visiting its condemnation on the past management of the New Haven it should not overlook these conditions which are affecting that property, as they are also affecting other railways, and for which neither the past nor the present management of the New Haven is responsible. Doubtless it is just that the stockholders of the New Haven and other railways should suffer the results of the un wisdom or incompetency of the directors and officers whom they choose to manage their properties. But because they have been unfortunate or unwise in their choice of directors or officers is no reason why they should be made to suffer not only the effects of their unfortunate or unwise choice, but also the effects of economic developments which the ablest and most conscientious management could not have prevented.

#### NEW BOOKS.

*Master Blacksmiths' Association Proceedings, 1913 Convention.* Bound in cloth. 236 pages. 5½ in. x 8¼ in. Illustrated. Published by the Association, A. L. Woodward, secretary, Lima, Ohio.

A general report of the twenty-first annual convention of the Railroad Master Blacksmiths' Association is given in these proceedings. This includes a complete report on each subject as well as a verbatim account of the discussion in the proceedings. The papers this year were on the following subjects: Flue Welding; Tools and Formers; Electric Welding; Drop Forgings; Piece Work; Case Hardening; Oxy-Acetylene Welding and Cutting; Heat Treatment of Metals; Cast Steel in the Blacksmith Shop, and Efficiency. The same fault exists in this association that is seen in so many of the other mechanical meetings, that an attempt is made to handle far too many subjects for the length of time allowed. The consequence is that nothing is done completely and no important conclusions are reached. In spite of this, however, the work at this convention is interesting and, to a certain degree, valuable.

*Traveling Engineers' Association Proceedings, 1913 Convention.* Bound in flexible leather. 371 pages. 5¾ in. x 8½ in. Illustrated. Published by the Association, W. O. Thompson, secretary, Buffalo, N. Y. Price \$1.50.

The twenty-first annual convention of the Traveling Engineers' Association, held in Chicago, August 12-15, 1913, fully maintained the reputation of previous meetings for the practical and beneficial manner in which the subjects were treated. Reports were made on: Uniform instructions to enginemen on the handling of superheater locomotives; Credit due to the operating department for power utilization and train movement that reduces consumption of fuel; What can be done to eliminate the black smoke evil on locomotives; Advantages obtained with the brick arch in locomotive service, and, Care of locomotive brake equipment on line of road and at terminals. In each case the discussion was thorough and extended. In addition to the reports, a number of prominent railway officials were invited to address the meetings. The speakers included W. L. Park, vice-president of the Illinois Central; W. A. Garrett, vice-president of the Chicago Great Western, and W. J. Tollerton, general mechanical superintendent of the Chicago, Rock Island & Pacific. The proceedings contain the full text of the reports, discussion and addresses and an index of the subjects brought up at each convention since 1893, when the association was organized. The subjects for discussion which will be presented at the next convention and the committees having them in charge are also given.

*Proceedings of the Fifth Annual Convention of the Tool Foremen's Association.* Bound in paper. 6 in. x 9 in. 133 pages. Illustrated. Published by the Association, A. R. Davis, Central of Georgia Ry., Macon, Ga., secretary. Price 50 cents.

These proceedings contain a full report of the recent convention held in Chicago. Many interesting topics were discussed, among which were the reclamation of tool steel, the form of thread and degree of taper for boiler studs and plugs, forging machine dies, thread cutting dies, and superheater tools. This association is made up of expert tool makers, and there is much valuable information contained in its proceedings.

*Railway General Foremen's Association Proceedings, 1913.* Bound in paper. Illustrated. 173 pages. 6 in. x 9 in. Published by the Association, William Hall, secretary, Winona, Minn. Price \$1.

The International Railway General Foremen's Association occupies an important field which is not covered properly by any of the other numerous mechanical associations. That its officers and members fully appreciate their responsibility is well illustrated by the work of the ninth annual convention held at Chicago in July, 1913. The proceedings fully demonstrate their activity and in addition to the verbatim account of the discussions and the full text of the reports, it includes the subjects to be discussed and the chairmen of committees to report at the next convention.

*Air Brake Association.* Proceedings of the twentieth annual convention. Bound in leather. 321 pages. 6 in. x 9 in. Illustrated. Published by the Association, F. M. Nellis, 50 State street, Boston, Mass., secretary. Price \$2.

This association is one of the most logical associations in the railway field. Its meetings are well attended, and the information presented is of great value to the men engaged in the maintenance and operation of air brake equipment. Many of the vagaries of the air brakes are discussed and means found for their elimination. This association perhaps more than any other similar association, calls on the engineering staffs of the manufacturers of air brake equipment and supplies for information that they are able to give concerning special investigations made in their respective lines. This year's proceedings contain papers on Undesired Quick Action; Operation of Long Freight Trains; Operation of the Triple Valve; Air Hose Failures; Location of Steam Heat Traps, and a report of the committee on Recommended Practice.



## Letters to the Editor.

### COMPARISON OF ELECTRIC AND HAND TRUCKS IN FREIGHT HOUSE SERVICE.

CHICAGO, October 22, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The figures given in an article entitled "Electric Trucks in Freight House Service," which was published in the *Railway Age Gazette* of August 8, purporting to show the saving effected by the use of electric trucks at the Jersey City freight station of the Erie, are somewhat misleading.

In brief, the figures referred to show a cost per ton of 27.4 cents with electric trucks and 38.9 cents with hand trucks. The items shown in the comparison, however, do not include a number of important charges which properly should be made against both systems if a fair comparison is desired. The most important of these items are the cost of the electricians, current, supplies and repairs, depreciation and interest on the original investment. If these be made with corresponding charges against the hand truck system when such charges are incurred, the following comparison will result:

	Electric trucks.	Hand trucks.
Tonnage handled .....	170,170 tons	183,371 tons
(a) Foreman, clerks, coopers, etc....	\$6,425.38	\$6,392.01
(b) Checkers and callers.....	8,715.13	10,830.23
(c) Loaders, stevedores and truckers	31,455.33	54,119.00
(d) Electricians and helpers.....	2,031.69	.....
(e) Electricity .....	962.22	.....
(f) Supplies and repairs.....	617.79	42.00
(g) Renewals .....	1,700.00	63.00
(h) Interest, 5 per cent. on investment .....	1,500.00	105.00
(i) Depreciation, 5 per cent. on investment .....	1,500.00	105.00
Totals .....	\$54,907.54	\$71,656.24
Cost per ton .....	32.27	39.09

The items (a) to (c) inclusive are those quoted in the article as the cost of handling; (d) to (e) are also given and should be included in the comparison. It is to be noted that the cost of electricity was unusually low. At the given daily consumption per truck of 7 k. w. the yearly cost to operate 24 trucks, assuming 300 working days in the year, and a power rate of 4 cents per kilowatt, would be  $24 \times 300 \times 7 \times \$0.04$  or \$2,016, which is more than double the amount given. The items (f) and (g) properly constitute what is usually known as maintenance. As there were 103 hand truckers it is fair to assume that there were 300 hand trucks. At \$7 each their cost would be \$2,100. Items (f) and (g) are computed at 2 per cent. and 3 per cent., respectively, of this amount and the resulting amounts are never exceeded in actual practice. The remaining items (h) and (i) were computed at the rate of interest and depreciation quoted as allowed by the Erie, but it would seem doubtful to anyone familiar with the operation of electric trucks in freight house service whether 5 per cent. is a high enough rate to charge for depreciation. The interest and depreciation of the electric trucks were based on a total cost of \$30,000, assuming the cost per truck to be \$1,250. It will be seen that this comparison reduces the saving from 11.5 cents to 6.82 cents. This amount saved on 170,170 tons handled by the electric trucks makes a total annual saving of \$11,705.59 instead of \$24,745.40.

Furthermore, it is to be noted that the hand trucks moved 183,371 tons of freight as compared with 170,170 tons moved by the electric trucks in the same period. To anyone acquainted with the effects of congestion in a freight house, the fact that about 40 tons per day more were moved by the hand trucks, presumably through the same terminal, will appear to have some influence on the cost.

It is also to be remembered that ultimately the cost per ton should include all overhead charges of the station platforms and other appurtenances that are used in handling freight. For instance, it would be unfair to neglect the interest charge in making a comparison between hand trucking and the telferage system as the latter requires a much more expensive building. Including all overhead charges, the writer has compiled the following figures from observations of automobile trucks in actual work

at several points. They are not offered in a spirit of controversy but simply for the interest which your readers will undoubtedly have in them.

COST PER TON OF HANDLING FREIGHT THROUGH 800 FT. HOUSE, 40 FT. WIDE.

Tonnage handled per day.	Freight handled by		Possible saving per year.
	Hand trucks.	Electric trucks.	
600 tons	48.6 cents	48.3 cents	\$636.46
700 tons	47.8 cents	47.2 cents	1,190.02
800 tons	47.2 cents	46.8 cents	1,103.11
900 tons	46.8 cents	46.1 cents	1,669.08
1,000 tons	46.4 cents	45.6 cents	2,235.02
1,100 tons	46.1 cents	45.4 cents	2,142.83
1,200 tons	45.7 cents	45.1 cents	2,695.33

The above figures include interest, depreciation, and maintenance on the cost of the buildings and on the equipment necessary for their operation; cost of receiving, trucking and stowing freight; cost of supervision and unproductive labor necessary to operate house; also, where electric trucks are mentioned, the cost of electricity and motormen. All labor was figured on the day wage system.

R. C. WELLER.

### INCREASE OF EFFICIENCY OF FREIGHT EQUIPMENT.

CLEVELAND, Ohio, October 28, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Increase of efficiency of freight equipment is solved when you have solved your smaller problems. In the first place, the actual handling of the cars is done by a class of men whose main object is the putting in of time and not the achievement of results beneficial to the company. This results in rough handling, causing shop delays, running through switches, causing yard delays, and many similar though apparently small delays, the aggregate of which ties up your cars. Again, take the crews that gather up cars from the industries. Their work is to bring the cars to the outbound classification yard. They will push them in on any track that happens to be empty, right or wrong, and say: "We should worry; let the other fellow dig them out." How is this to be prevented? Increased supervision. If you will spend a night in a large yard and see the number of incorrect moves made because the crews have no one to watch them, you will be convinced that the money thus thrown away will equal the cost of much supervision. I think the railroads are beginning to see the value of increased supervision more and more every day.

Did it ever occur to you how, in our efforts to centralize operations, we make many false moves? Why must every car go to the yard to be classified? In most cases we do not know the destination of a car until it is tucked away in the yard, except, of course, the regular merchandise cars from our freight houses which are classified in most cases on the house tracks. If, however, we were to ascertain from the industries during the day the destination of the cars to be collected from their sidings, much of this classification could be done as the cars are switched out, as a yard clerk could card them before the switcher got there. I believe that an appreciable part of the yard switching could be eliminated in this way.

Another thing; yard discipline is most lax. The men take advantage of the slightest opportunity to "camp." They wait for someone to tell them what move to make next. A crew goes up into a siding for a car. They may be gone twenty minutes or a couple of hours. At any rate, they can tell you what took the time and you have to take their word for it. It is just as criminal for the railroads to allow this condition to exist as it would be for them to leave their cash drawer unlocked. Men are weak and no one has a right to put temptation in their paths. When they see how easy it is to do this sort of thing, it becomes a common practice.

It is true that in many places the railroads lack the facilities to properly handle the amount of business offered them today. but it is not so bad as some would have us think. The weakness lies in the human element. There has been so much talk about this lack of facilities that it has become a Frankenstein and we shrink at the sight of it. The effect is most demoralizing upon the men, who use it as a club whenever brought to account for slow work.

With our system of train despatching we expend every effort to make time upon the road and there our efforts cease. We hold the engineman responsible for maintaining his schedule, and if he makes a practice of falling down, we try the next man out. Why, then, should we not demand better yard performance? This, again, means increased supervision. A yard does not run itself for fifteen minutes except to run away from you. There is no other place wherein a move counts so much for good or bad as in a yard.

It does not take an expert to see what is wrong with a yard, but it does take an expert to successfully run one; and yet we put our yards in the hands of men with a road training and expect them to do it all, for we give them as yard clerks a bunch of young boys in their teens incapable, for the most part, of serious thoughts.

It is the practice at many points, when cars come from another line, to have these cars carded to the agent at the transfer point in question. These cars are lost track of in the yard until billing is received, maybe a day or so later. This causes much delay and expensive rehandling. Cars should be carded to destinations. This calls for a closer co-operation between the railroads.

Another trouble is the conflict between the yard master and the terminal agent as to whose duty it is to do this or that or the other thing. The agent says that the yard clerks come under him, while the yard master thinks they are subject to his orders.

M. R. SUTHERLAND,  
Student in Operating.

#### CAN PULLMAN EMPLOYEES CO-OPERATE TO IMPROVE THE SERVICE?

CHICAGO, November 24, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

On Tuesday night, November 18, I had an experience in Cincinnati, Ohio, which it seems to me is worth calling attention to on account of the frequency with which travelers meet with similar experiences in practically every large terminal in the country. No special criticism is intended on the road mentioned, as the Pullman Company and the station officials appear mainly to blame.

On the night mentioned I reached Cincinnati at 7:40 p. m., and went immediately to the Pennsylvania station to secure a Pullman reservation to Louisville on the Louisville & Nashville train due to leave at 10:30 p. m. I found that all lower berths in the Louisville car had been sold as well as some of the uppers. I reserved and paid for an upper berth. The Louisville & Nashville advertises that Pullman cars operated on trains leaving a terminal after 9 p. m. will be ready for occupancy at that hour. The Pullman agent at Cincinnati advised me that it was usually 9:30 p. m., however, before the Louisville car was ready. On the date mentioned this car was not backed into the station until 9:50, and when the waiting passengers were allowed to board it about 10 o'clock we found that none of the upper berths had been made up. The porter disclaimed all knowledge of the fact that any uppers had been sold and refused to start to make them up until after the train had left, in which he was upheld by the conductor. On account of various delays it was after 11 o'clock before the train left the station, making it nearly 12 o'clock before the last upper berth was made up, and we were allowed to go to bed. The train on which this car is run reaches Louisville at 2:10 a. m., and the car is set out in the station yard. The porter informed us before going to bed that the car had to be vacated at 7 o'clock, and with admirable promptness all the passengers were awakened at 6:30, producing a degree of congestion in the wash room which made it impossible to dress in comfort in time to leave the car at 7 o'clock. It was necessary to leave, however, as the car was pulled out of the yard very shortly after that hour.

After making due allowance for unusual conditions which may have existed on the date mentioned and neglecting entirely to mention the apparent lack of courtesy on the part of the porter and conductor, it is difficult for the passengers who were

denied three hours of sleep to which they were entitled to understand why a little closer co-operation is not possible between the Pullman Company's agents who receive the money and make promises as to the service to be expected and the employees who render those services. It may be impossible for an agent to advise a Pullman conductor that upper berths have been sold more than two hours before the time of departure, so as to allow those berths to be made ready, but if so, most of the traveling public are unable to understand why; and they believe they have an excellent justification for complaint.

FREQUENT TRAVELER.

#### THE NEWSPAPERS AND THE RAILWAYS.

NEW YORK, October 20, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Your editorial in a recent issue (October 17) on government ownership of railways is excellent as far as it goes, but it does not go far enough. The faults of which you justly complain are not confined to the trashy magazines and yellow newspapers. Some of the eminently respectable dailies disseminate an immense amount of misinformation about railways, and father a great many unsavory schemes. The editors of these newspapers know as much about railroading as a cat knows about calculus, and yet they persist in airing their worthless opinions, and insist upon flouting practical men.

The vicious tendencies of scurrilous publications are well known. It is harder, however, to combat the ignorance and stupidity of that section of the press that is supposedly reliable. Violent and intemperate attacks on the railways do far less harm than the tactics to which I allude.

I could go into this matter further, but do not wish to occupy too much of your space. If, however, you will look into the situation yourself, you will find that what is needed is a campaign to compel newspapers to show at least a decent regard for the truth in dealing with railroad matters.

ARTHUR CURRAN.

#### A YARDMASTER ON CAR EFFICIENCY.

HOUSTON, Tex., December 2, 1913.

Referring to Arthur Hale's letter in a recent issue of the *Railway Age Gazette* about handling freight cars through terminals, it is a big job to keep loads and empties moving in the right direction and requires "eternal vigilance" on the part of all the men concerned. Each department must work in harmony with the other departments to secure success. I find that one of the most essential things is to keep the proper cards on the cars. A car without a proper card or tag is a "dead one," and is bound to be delayed. So is a car with a "hold" tag on it. Other essentials are to get freight lined up properly; be watchful of way bills and keep them with the cars; notify the agent and superintendent of the perishable freight on hand, and keep it moving.

A yard master with a poor memory is in a bad fix; he has so many people to satisfy and so many orders on his desk. He cannot carry these orders around with him continually. He must remember them or have responsible engine foremen to execute them. It is most important that there be good, dependable men employed in the yard. Let the men know that you rely on them and have confidence in their ability, especially in the cases of emergency that are forever cropping up in a big yard. Never allow yourself to become excited. Place your industry cars promptly and handle your empties with "promptness and despatch." Keep the "hold" track as clear of cars as possible.

It is a continual dig and a continual fight. Handling a big yard is an exciting game, a big study—and a man's job. "Vigilance" is the watchword in getting cars through a terminal promptly—but nothing counts for much unless you have power to handle your tonnage.

H. W. CHILDERS,  
Yard Master, Sunset-Central Lines.



# POINTS ON RUNNING A LOCOMOTIVE SAFELY.\*

Runners' Experiences in New England and Texas; Canada and Mississippi; West Virginia, Saskatchewan and Everywhere.

## ON A CROOKED AND HILLY SINGLE TRACK.

By CHARLES H. DEFIBAUGH.

Western Division of the Western Maryland.

I give you my personal experience of 23 years of service as a locomotive engineer, a great part of which has been in fast local passenger service, making a run of 114 miles in four hours, 55 minutes; and making 42 stops on each run; over one of the most crooked and hilly single-track railroads in the United States. I have acquired, with a certain degree of success, the habit of keeping a vigilant lookout over every foot of track. I have endeavored to train my mind so that when I step on a locomotive to start on a trip it is free from all thoughts except those relating to the duties to be performed on that trip; and have so trained myself that the manual operation of the locomotive is performed without taking my eye from the track ahead, except for an instant at a time. I have also familiarized myself with the territory over which I run so that the approach to a certain locality brings to me a recollection, a sort of mental picture, of the duties to be performed at that particular locality. I have trained myself so that when anything occurs to temporarily distract attention, to first of all keep in mind the view ahead. When any trivial adjustment is needed, or a defect is to be corrected, not serious enough to require a stop, I call on the fireman to make it, and continue to keep a lookout ahead. I also make it a practice to prompt the fireman to look out constantly when not firing, and this has in many instances been a factor for safety when the view was best from the left side. I have practiced the procedure here outlined so long that all features are now almost involuntary on my part; and I would no more think of running over a piece of track without seeing it than I would attempt to walk on a busy track blindfolded.

I strongly recommend this habit, as I have followed it since a certain day in 1896, when I ran by a train order signal and was suspended for it. After resuming duty again I applied myself especially to making a constant lookout my first and greatest duty; and by so doing I have had but that one suspension in my 23 years of service as an engineer. My experiences have taught me to live up to the rules; to beware of taking chances. "Safety first, speed afterwards." I would summarize the essential things as follows:

The locomotive engineer before beginning a trip should personally examine and know that every part and appliance of the locomotive is in as near a perfect condition as is possible. This will enable him to give his attention more fully to the lookout ahead and the duties of the trip he has started on. When he starts on a trip he should endeavor to free his mind from all thoughts except those pertaining to that trip. He should train himself mentally and manually, so that he can make every manipulation of the locomotive while it is in motion without taking his eyes off the track, except for an instant at a time. He should be so familiar with the territory over which he travels that the approach to a certain locality should bring to him the recollection of a duty to be performed at that particular point. For example, if it be an approach to a station stop, he should have a mental picture (a sort of instinct) in his mind, that he should shut off steam, apply brakes and sound the proper whistle signal; note all visible signal indications, and duly acknowledge the same in strict compliance with the rules. Above all other duties, at all times and places on the trip he should anticipate emergencies and be prepared to meet one without any great degree of surprise.

Occurrences in the cab or about the locomotive in the nature of slight defects requiring correction or adjustment while running should not be allowed to distract the attention of both men

in the cab from the view of the track and signals. The proper mode of procedure should be for one to correct the defect while the other keeps a good lookout. Should the defect be a serious one a stop should be made for repairs, so that there may be no lapse in the vigilant lookout ahead.

Every engineer should make it a practice to instruct and prompt all firemen to keep a good lookout at all times when not firing or performing their other duties; and should instruct them to perform their duties as much as practicable at times when a lookout is least required from the left side of cab. They should endeavor to impress upon the minds of their firemen that a good lookout ahead is as great and important a duty as their other duties.

If the above described procedure is followed, every engineman can make a good record for safety; a record which will be a great improvement over the present operating conditions of today on many railroads.

## CAUTIONS FOR THE YOUNG FIREMAN.

By M. J. KRAEMER.

Fresh from the farm, when obedience to parents was the rule, I hired out for a fireman on the Marquette, Houghton & Ontonagon, now the Duluth, South Shore & Atlantic. I was sent to fire engine 27 on a branch line at Republic, Mich. After introducing myself to the engineer, he eyed me sharply and said, "All right, my boy" (I was only 16 years old but I passed myself off as 20), "if you are willing I will make a first-class fireman out of you, which will perhaps assist you to become an engineer of the first class." I started in with a determination to become a first-class fireman; but I will admit that the engineer had a good many laughs on me. But after six months he had no more laughs coming, for I was then as handy with the scoop in cutting a letter "S" distributing coal in firebox as he was. On account of never coming to a shop this engineer had to do his own repairing and, having won his confidence, he asked me to help him do his repairs. The first was putting in engine truck brasses with full explanation of the detail. The next work was lining up cross head gibs and how to find center; the next, reducing rod brasses, shortening and lengthening of main rods, striking point of piston, and lining driving boxes. He also took pains to instruct me in all cases of wrecks, whether on one road or another, with cause, how it happened and how it could have been averted.

When I left this engineer to go on the main line he took pains to tell my new engineer what there was in me, and, behold, I was with another good teacher.

It is not always the fault of the fireman when he ignores the orders of his engineer pertaining to his duties. It is at times the fault of brother firemen, as in my case; sometimes the fault of officers of the company. I myself was informed by two different roundhouse foremen not to pay any attention to the engineer I was with; that he was no good.

The following are things which produce an unsuccessful engineer.

- (1) Indifference while a fireman.
- (2) The virus of hatred planted in the heart of a young fireman against the engineer by officers of the company or by his brother firemen.
- (3) Too fast promotion.
- (4) Indifference of an examiner. Examiners will allow the examined to write questions and answers out of a book, a very good method to make those examined indifferent in their duties.
- (5) Forcing an examination upon a fireman when he himself knows that he is not competent to step on the right side, yet sees that he must do so or lose his turn, and go to the foot of the list. I will admit that we can learn all we need or want to know through books; but books cannot put judgment in your brain; it must come through practice only.

\* These articles, forming a part of the series begun in our issue of November 14, and continued in that of November 28, have been much abridged, the aim of the editor being to give only those narratives of personal experience which supplement, but do not repeat, things told by the writers of the preceding papers.

For the last four reasons, officers of the company are to blame.  
*Kamsack, Saskatchewan.*

### KNOW ALL ABOUT YOUR ENGINE, YOUR TRAIN, AND THE ROAD.

By F. E. PATTON.

There is no doubt that the majority of engineers are well adapted for the service and make good smooth runs without exertion and seldom ever have any trouble to speak of; while others appear to have either missed their calling or have not had the proper training.

In my opinion, the proper habit is partially acquired by observation while firing, and by living strictly up to the rules; and if a man is fortunate enough to fire regularly for a good, cool, level-headed engineer who is in the habit of making smooth runs and is seldom in trouble, he will naturally acquire his habits and do likewise when promoted, provided he has a head of his own.

He must first learn how to locate defects on his engine and have proper repairs made, and if the defects are always found as reported he will never have any trouble getting his work done promptly.

He must next learn how to start a train gently without jerking, and avoid slipping by the use of a little sand before starting. The brakes should be applied a little early in making the first stops after leaving a terminal. He will then know how to brake the remainder of the trip. He should not use steam too soon after a stop or slow down; he must give the brakes time to release and the slack a chance to adjust itself first. Try to improve every trip in starting and stopping, and keep in mind the amount of slack in train, and where it is, at all times. Make a heavy brake pipe reduction on each application before releasing the brake, and there will be less danger of sticking brakes, less damage to draft gear and lading.

Practice fuel economy and good boiler feeding and work in harmony with the fireman. He will have but very little trouble in getting over the road, and by taking advantage of every move to save time, a good average trip can be made without running too fast; and there will be less trouble with hot boxes. An engineer who learns to handle a freight train successfully will have no trouble in handling a passenger train, and he can train himself to do it without hard work or anxiety.

The principal factor in locomotive running is to get right before starting out on a trip; to know when a train is under control; know how fast a train can be run with safety and in what distance the train can be stopped in emergency or in service, allowing a safe margin for the latter, especially in making the first stop on each trip.

Observe all signals, keep a constant lookout ahead for trespassers and animals or other obstructions on the track; be on the alert and ready to respond to any emergency. The engineer should never allow anything to attract his attention away from the right of way. He should teach his fireman to avoid putting in a fire while curving to the left, as it is up to him to watch the track ahead until the end of the curve is reached (especially on fast runs), provided there is no other member of the crew riding on the left side watching the track ahead. They should, however, on leaving a curve and after straight track is sighted and found to be clear, look back at the trucks on train and see if they can detect any defects or hot bearings.

The engineer should never attempt to race with a train on a road running parallel with his road, especially if they have to pass through corporate limits of cities or towns or where their racing would terminate at a railroad crossing; and at a crossing which is clear for him to cross, if there is a train approaching that he has any doubt about he should not start to cross until he is satisfied the other train can stop.

If "white" is used for clear, he should always observe the position of the signal arm at night, as the signal might be set for "stop" and the red lens broken or fallen out.

He should report all tall trees that are on or near the right of way that would fall on the track if blown over.

There are many changeable conditions that make it necessary for the engineer to change his running to suit the conditions. He must think and act quickly. His left ear must be trained to be sensitive to the slightest sounds in the cab, and his right ear as sensitive to sounds outside of the cab; and his mind on every bearing on the engine and train. In fact, the good engineer is an automatic machine and is so accustomed to quick judgment that he does it without exertion. By careful study he learns something along the lines of safety and efficiency each trip, that he never knew before, and the fireman that observes his movements will get the habit, and make good.

When making new time tables I think it a good idea to have four or five of the oldest engineers to advise where the time can be shortened with safety and where more time is needed, as they are familiar with it and can give correct estimates. There are also many suggestions which engineers could make that would improve the service, and they are sometimes timid about calling to the attention of officials; but since the safety first movement has been inaugurated, it comes out without criticism and conditions are improving rapidly.

*Columbus, Miss.*

### FROM A RUNNER TRAINED IN THE NAVY.

By EDWARD W. WALKER.\*

Never trust the other fellow, or think for a moment that he will be where you think he ought to be, or doing as he should. The only safe course for you, is to assume that he is not, and keep a perfect lookout for him. I think a perfect lookout can be kept without any great strain on the mind, provided the runner is of the proper temperament, and of good health, with an active brain and a retentive memory.

Now, Mr. Engineer, if you are not a perfect lookout, you are an imperfect one. If you are a perfect lookout, these words do not concern you. If you are one of the imperfect ones, brace up, and quickly. Have you a grouch, throw it away. Create a pleasant smile and a cheery manner. Never move your engine without looking in the direction you are going to move, and insist on your fireman doing the same. Then the surprise test will have no terrors. Call all signals to your fireman in a cheery tone of voice. They may be called correctly in a great variety of ways which will prevent monotony. For example: Green eye twice; a pair of greens; two greens we have; yellow eye; cat's eye; red eye, high; red eye, etc. The variations will prevent the force of habit getting the better of you. Habit *may become dangerous*.

Have the fireman run the water; nine times out of ten he would like to do so. You can easily keep one eye on it once in a while. This will give you a better chance to keep your lookout. Live up to every rule as strictly as though your life was forfeit for any infringement. Impress on your mind the fact that yours is the most important position on the train, and that men, women and children place implicit trust in you.

*Wilton, N. H.*

### OLD TIMES AND NEW, IN CANADA.

By NELSON FULCHER.

The Canadian Pacific Railway was building west from the city of Ottawa in 1882 and was at that time hiring men in considerable numbers. Each new man, as he made his initial run, was picked to pieces and marked down as good or bad as the case might be. One, who may be called Jack, was a good fellow among the boys; and quite well educated. He always made friends. As he was easily led he soon got into reckless company while off duty and never got the proper rest; and as his work was mostly night freight he would consequently fall asleep on the road, with the expected result—a mixup.

\*Mr. Walker runs on the Boston & Maine in New Hampshire. He has been an engineer twenty-one years, six years mostly on night passenger trains. He was formerly and for about 22 years in the merchant marine and the United States Navy.



My turn came for promotion. I had been wiping, and now I was to go firing. I had hoped that I should have better luck and that I should fire for some one else; but no, Jack was to be my first engineer. And from him I got my first lesson, which was caution. I had heard about Jack and had made up my mind to keep my eyes right on him. During my stay with him, there were occasions that I have had to whistle for stations and to shut off steam so as to get the train stopped before we did something wrong; for those were the days in which all brakes were hand brakes. One night, after firing for Jack about one year, it happened that we were on duty at one stretch for close on forty hours, and I was all in. I could not keep up steam to the full pressure. We stalled on a little grade and, the engine stopping, I woke up. I looked over to Jack, who was sound asleep, and I let him sleep until I got her blowing off! Then I shook him and calmly said that if he did not drop her down he would stall. He dropped her down, but by this time she was anchored; so all the blame of backing down and taking another run to get over the grade rested on his shoulders. We both managed to stay awake the rest of that trip, as we then were near the terminal.

Shortly after this incident I was promoted, and was sent on the next division to handle a freight run, while Jack was on the home division running a night passenger. But one cold morning we heard of a terrible wreck where four had been killed and seven badly hurt. The coroner's inquest enlightened us to the fact that Jack had run two miles past his regular time card meeting point and was asleep when he hit No. 2. Needless to say he lost his job. No engineer can do his duty if he does not take his proper rest.

Within the last few years here in Canada there has been passed a "Lord's Day Act," and it is one of the best. Since the passing of this act it is noticeable that there is a decrease in the number of trains run on Sunday, such as way freights, work trains and excursion trains; and as a consequence the employees are at home or at church. This tends to elevate the standing of the engineer himself as a citizen. It places him on a par with other men. Instead of being liable to a call at any time on Sunday he is now a man who can look forward to Sunday as a day of rest. That, to my mind, is a country-wide recognition of the fact that an engineer needs proper rest.

Within the last few years the entire responsibility for the speed and handling of every train has changed from the train crew to the locomotive engineer. His responsibility is increasing each year. Each year the public demands better service, each time examination becomes more strict and discipline more rigid. There never was a time when as much was required of the engineer as now.

*Sault Ste. Marie, Canada.*

#### ENGINEER MUST BE CONTENTED.

By E. C. LAUCK.

The only way you can acquire this faculty of knowing everything pertaining to your duties is to be contented. Contentment in any life, if there can be such, would mean the height of success. It is said that no man was ever fully contented, but the higher the degree of contentment attained, the higher his success.

The following narratives present actual experiences, and I confess they have taught me a lesson. I have tried to profit by my experience and have, to a certain extent, succeeded. Not one penny has it been necessary for a railroad to spend on my account since I learned my lesson.

Some years ago I was working on a certain railway in Canada as an engineer. I was assigned to a work-train working about eighteen miles from the away-from-home terminal. Saturday nights we tied up at the away-from-home terminal, which allowed us to have the necessary repairs done on the engine, but gave us a poor chance of getting home to stay over Sunday. The only chance we had of getting home was to dead-head on a passenger train which came along about eight o'clock in the evening. If we missed

this train we had nothing to do but sit and look at the mountain scenery until time to go to work Monday morning. This particular Saturday we were late in getting through work and of course it put us on short time running the eighteen miles which lay between us and the passenger train. After we had got our orders and were ready to start, the time had narrowed down to a minimum, and in order to get in on time the iron horse had to be given a little extra steam to urge her along. You have often heard, no doubt, that two trains could never pass on the same track. I was thoroughly convinced of this after that night. About ten miles from where we had started we struck an open switch and headed in on another train on the siding, that was preparing to pull out on the main track. This happened inside of yard limits and anyone familiar with train rules knows that I should have been running under control. The impact of the two trains was terrific. It has always been a mystery to me how anyone escaped being killed or at least maimed for life. I suppose Providence was with us and it was not ordained for anyone to suffer. I laid the cause of this wreck to the want of contentment. Some may say it was caused by not attending to business. I agree with them, but if I had been contented I should not have been in such a hurry to get to the terminal and in all probability I should have gone through those yard limits under control, as the rules required; and I could have stopped. My mind would have been on my business and I could have seen the open switch. My eyes were riveted on the track, but I was blind to the open switch.

To illustrate again: Some three years after the wreck just mentioned I was running an engine on a trunk line in the southwestern part of the United States. Going out on the road one night not feeling any too good, for the want of sleep, I experienced a lesson which made a deep impression upon my mind. The last ten miles of the run was up grade. After getting the train stretched out on the hill we were making not over eight or ten miles an hour. My duties then were reduced to a minimum and my mind commenced to wander, chiefly thinking of that cozy bed awaiting me upon my arrival. A feeling of envy sprang up in my heart for those who perform their duties in the day time and can sleep at night. That frame of mind overtook me and I was soon in slumberland. I slept on. I awoke in a dazed condition, startled out of my wits, and, lo, what did I see? The beams of the headlight fell upon a string of cars. Naturally, I reached for the brake valve, throwing it in the emergency position, but no sooner had I done so than I saw my mistake and I threw it around in full release position. Anyone acquainted with the air brake knows the result. To size the whole thing up, I had gone to sleep and on entering the terminal the reverberation of the sound caused by the movement of our train between strings of cars on either side awoke me with a start. The track was slightly curved and of course the headlight showed directly upon a string of cars and I took these cars to be another train; but in reality they were only storage cars in the yard. The consequence was three draw bars were pulled out and the ends of two cars loaded with perishable fruit. "What caused the wreck?" "Non-attention to duty caused by a discontented habit of mind."

I could relate many similar cases, but it would not be fair for me to tell of another man's faults. When you get contentment for the individual on a locomotive you have solved the problem of how to avoid 99 per cent. of the wrecks which enginemen are to blame for.

*Denison, Texas.*

#### THE CHANCE TAKER.

By "OBSERVER."

Speaking generally of the difference in engineers, while they are all trying to handle the business promptly, there is a class that are unfortunate in a way, while yet they get the best protection that the train despatcher can afford because

they are "chance takers" and will do any kind of a stunt to run around some other man, regardless of conditions, in order to keep on the good side of the despatchers.

There are others whose intentions are good and they try to do everything exactly right, yet their style doesn't always suit certain despatchers. If they fail to make a close run the despatcher will give them bad handling afterward. There is only one cure for this, and that is for the road foreman to ride with him, by request of the trainmaster, to ascertain the trouble. He finds that he is all right. Then, of course, the road foreman will ask him about some poor trips he had made recently and when advised of the insulting telegrams he had received and the deal the despatchers gave him on certain trips, he will tell him to go ahead and keep doing the right thing; things will clean up and the runner will turn out to be one of the best men.

The despatcher can fix the train sheet up in fine shape for the chance taker, and the superintendent thinks he is a "wonder" until he gets him on the carpet.

He often gets to his engine late and asks the fireman to oil around for him, while he changes his clothes, and after the air test he is ready to leave, not knowing whether the sand pipes are open or whether they will hit the rail or not; however, he is a "hot shot."

He fails to stop for a block that is set at "stop" because he found this block out of order on a previous trip.

There are some men that are a little weak, who apparently have been promoted too soon on account of a rush of business. Others will never make runners as long as they live, and their firemen will no doubt acquire some of their habits also. There should be some method adopted to determine the fireman's knowledge and ability at certain periods, and if he is found to be bright but firing for the wrong man, have him changed and watch the results. If a man is found to be lacking in ability, have him advised that his services are unsatisfactory, unless, of course, he can be set right in some way. This can be largely overcome by close observation.

The first trip I fired on a passenger run was for a man who did not care if I put in a fire on a curve to the left, which I did thoughtlessly on account of being used to doing it on freight, having the head brakeman on the seat looking ahead. After I had discovered my mistake I started to apologize to the engineer for my ignorance and the first word I spoke, he closed the throttle and applied the brake in emergency (while running about fifty miles an hour on straight track) and asked me what I had said. I then saw my finish, and his also, if I remained on the run with him, but I managed to make a change without losing his friendship.

While firing a yard engine one day I noticed a covered wagon trying to cross ahead of us while we were shoving four or five cars about six miles an hour. I signaled the engineer to stop and he quickly applied the brake. We did not strike the wagon, but the jerk threw the conductor from the top of a box car to the ground, striking his head on the rail, fracturing his skull. This taught me to ask the fireman if all was clear before shoving over crossings.

Another dangerous practice is the brakeman going in between on the engineer's side to couple hose and crawling through to the other side to give the fireman the signal to move, while the engineer is waiting for him to come out on his side before he will move. This causes delays because the engineer should not move until he was positive the signal was given by the same man that had gone between the cars.

I have made several mistakes in failing to compare time. I was running on a time order with my watch stopped, and as I appeared to have plenty of time was not crowding the engine, and I noticed the conductor coming over the train in a hurry. I looked at my watch and found that I had the same time that I had when I started; then "business picked up." Another time my watch lost ten minutes on the trip and I had not noticed it because I had not compared time.

The watch was running and I had great confidence in it.

## ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.

The winter meeting of the Association of Transportation and Car Accounting Officers was held at the Hotel Galvez, Galveston, Tex., December 9 and 10, with 126 members in attendance, and President F. Price in the chair.

The report of the executive committee shows a membership operating 260,334 miles, and having in service 2,631,966 cars. J. M. O'Day (chairman), T. S. Bell and J. W. Nowers have been appointed a committee on conference to consider subjects jointly with a similar committee of the American Railway Association and the Master Car Builders' Association.

The association did not approve the recommendation of the Committee on Car Service that per diem rule 8 be modified to provide that when a car is detained awaiting receipt of repair material which must be obtained from owner, per diem should cease from the date the necessary material is ordered from the owner until the date on which it is shipped, and that repair material exceeding 125 lbs. in weight be shipped by express. In this connection the association recommended to the American Railway Association that rule 8 be abolished.

The form for use by shippers in ordering empty cars for loading, and the form of station record for use by agents in recording orders for cars, presented by the committee, were adopted for submission to the American Railway Association. The association concurred in the recommendation of the committee that it is undesirable to make any change at present in Car Service Rules 1 to 4, which prescribe the method of returning cars to owners.

The committee on continuous home route cards recommended a form of universal home route card, to be provided by the car owner and to accompany each car delivered off its rails. The card is to remain with the car during its entire absence from the home road, to indicate the proper route of the car when empty, but to be so utilized as not to interfere with the application by the possessor road of the spirit of car service rules 1 to 4. It also recommended that the universal home route card be handled in the same manner that card waybills are handled today, believing that the attaching of the card to the car would be undesirable. In the opinion of the committee the adoption of the proposed method would contribute to a more prompt handling of cars and would eliminate a large proportion of setbacks and delays. Under the use of the proposed card, it will be unnecessary to hold cars awaiting home route information, and agents will at all times have at hand information to enable them to load or route cars by routes that will secure their return to the owner with a minimum haul. The full information provided will eliminate the difficulty that frequently arises where a car is doubled back on any given route. The committee feels that one of the greatest benefits to be derived from the use of the proposed card is the elimination of cross hauls of empty cars, as well as the elimination of long hauls over circuitous routes of cars en route home, where substitute short routes could be provided by careful observation of the data accompanying the car.

The proposed card was adopted by the association with minor changes, for submission to the American Railway Association. The association also recommended to the American Railway Association the amendment of car service rule 5 to provide that each car delivered in interchange shall be accompanied by the owner's universal home route card.

The list of accepted assignments of reporting marks for private cars, presented by the committee on office methods and accounting, was adopted for submission to the American Railway Association. The report of the committee indicated that approximately 300 owners of private cars have accepted assignments of reporting marks.

In this connection, the committee also presented a list of assignments of reporting marks to cars of railroad ownership



which has been prepared with a view to preventing duplicate reporting marks. The list embraces an assignment of marks for every standard gage railroad in the United States, Mexico and Canada, and, in due time, it is contemplated that all cars will be stencilled with the assigned reporting marks. The marks are limited to three letters, except in certain instances where "&" is used to enable car owners to use reporting marks which correspond to the corporate initials of owner. The committee requested that the list submitted be adopted in principle only, and that authority be continued with it to modify any assignment on request of car owner where it is possible to do so without duplication of reporting marks. The association instructed the committee to submit each set of assigned reporting marks to each railroad, with an appropriate communication, in order to afford opportunity for car owner to definitely accept it.

In connection with the subject of per diem in the case of cars placed on industry tracks which are accessible to two or more railroads not protected by an interchange report, and which cars are taken off of those tracks by a road other than the one placing them, the association adopted the following rules for submission to the American Railway Association:

1. Empty cars diverted to or confiscated by another road, either loaded or empty, should be reported as interchanged as of the date and time originally placed by the delivering line.
2. Loaded cars after being unloaded, diverted to or confiscated by another road, either loaded or empty, should be reported as interchanged as of the date and time released from inbound load.
3. Loaded cars reconsigned with the original load should be reported as interchanged as of the date and time reconsigning orders are delivered to the receiving line.

The association concurred in the opinion of the committee that it is undesirable to recommend a modification of rule 1, code of per diem rules. The association adopted the recommendation of the committee, for submission to the American Railway Association, that two weights of paper be used for the interchange report form No. B-1, as follows: First: That the main report, which is filed intact, be printed on a good quality of bond paper of the basis of 14 lbs. to the ream of 500 sheets of the size 17 x 28 in. Second: that the sheets which are to be cut up be printed on a good quality of bond paper of the basis of 24 lbs. to the ream of 500 sheets of the size 17 x 28 in.

The committee reported adversely on the suggestion to publish the names of roads that are delinquent in the matter of forwarding junction cards daily, and was sustained by the association. It is recommended by the association that cases of delinquency in this respect be brought to the attention of the chairman of the committee on relations between railroads of the American Railway Association. The committee on office methods was also requested to consider the subject of missing junction reports.

The committee reported that, at the request of the American Railway Association, consideration had been given to the question of devising and recommending a uniform and efficient method of sealing cars and maintaining a seal record. The association requested that the tentative draft of rules, submitted by the committee, be mailed by the secretary to each member of the association for consideration and recommendation as to changes; and also adopted a resolution requesting the co-operation of the Freight Claim Association in the preparation of a final code of rules to govern the use and recording of car seals. The association adopted the recommendation of the committee that each carrier insert in its registration the name of the officer to whom orders for repair material should be forwarded, and that the publishers of the *Official Railway Equipment Register* be requested to insert this information.

Investigation of the committee on conducting freight transportation develops the fact that comparatively few box cars are marked on the interior with a grain line, and that where the grain line has been applied there is no uniform practice with reference to including or excluding the usual 10 per cent. above marked capacity of cars. The association recommended to the

American Railway Association that action be taken through the proper channel to secure the application of grain line marks on the interior of all cars suitable for grain loading, and that such line be located so as to include 10 per cent. above the stencilled carrying capacity of the car. The association also recommended to the American Railway Association that suitable cards be attached by the car inspector, agent or yardmaster, both inside and outside of each car, immediately a leaky condition of roof or sheathing is discovered.

The committee on joint interchange and inspection bureaus reported the establishment of a joint bureau at Shreveport, La. The committee is informed that the roads entering Dallas have determined to extend, for experimental purposes, their present car inspection bureau to include the preparation of the interchange reports. The Des Moines bureau reports that since its inception not a single complaint has been received with regard to the interchange record at that point.

Reports of progress were received from the committees on handling railroad business mail and conducting passenger transportation.

D. C. Cheney, fuel inspector of the Chicago, Milwaukee & St. Paul, presented an article on equated train tonnage, illustrated by the forms in use on the Milwaukee.

It was decided to hold the next meeting of the association at Savannah, Ga., June 23 and 24, 1914.

## THE FREIGHT SOLICITOR'S ART.

BY W. B. TOWNSEND,

General Agent of the Missouri Pacific-Western Pacific System, Oakland, Cal.

I have just finished reading a news item wherein it is stated that an ex-freight solicitor has been appointed to a \$50,000 position on one of the largest railroad systems in the country, a man who ten years ago, was soliciting freight at San Francisco. It was soon my pleasant experience to note how well this official stood in a community which he had left some ten years previous, as evidenced by expression of opinion when he returned to San Francisco connected with a new road. Soliciting freight under him and making frequent visits on business houses I was surprised at the number of merchants who wished to be remembered to our new official, and who went out of their way to give him their freight, and even to induce their friends also to swing their business his way. Here was a man with a personality that could not be forgotten in years. Such a man is sure to be valuable to any railroad, whether in an official or a minor position. A man who can secure and control freight for his system is a big factor. For the time being the railroad does not count.

I have also had occasion to see the result of the work of another official who had previously solicited freight on the coast and now visits it once a year. Although this man represented a small road with a short haul, and has not lived here for ten years, he made such a good impression and was so conscientious in his work while here, that his old friends still say, "I want to put Harry in on this car, if I can help him." So many of them said this that he has now been appointed to a position of great responsibility where his personality will count in a larger field.

The ideal freight solicitor is a man between the ages of twenty and forty years, athletic and of good appearance. He should come to the office in the morning shaved and with a clean collar, and should be anxious to get out on the street and amongst his friends. A man that hangs around the office and talks baseball or prize-fights, and is afraid to get out in the rain, will never be anything better than a solicitor; he is lucky to hold on to that. Above all things, a man should be proud of his business and take a pride in his road. The solicitor has something for sale, namely, transportation, and the transportation business is an honorable calling. A good solicitor should be industrious. He

should be a good mixer and be able to talk to the officers of a church and secure a routing order covering a church organ, and then go from there and secure an order for a car of beer or whiskey from the leading saloonman. He should maintain a proper dignity in one case as in the other. In this connection it is in order to observe that the day of taking the shipper or consignee up to the bar and getting him full in order to secure his business is past, way past. The freight solicitor who insists on these tactics to secure his freight only makes himself a nuisance and gradually loses his friends. The big man in any business has no time or inclination for anything of this kind.

The traffic manager of any large shipping concern, after getting acquainted with a solicitor takes an interest in him; and a nice luncheon will generally help matters. Most men are fond of cigars, and a freight solicitor should be well supplied with them; but I have seen many cases where a cigar given in the wrong way hurt more than it helped. Do not give a man a cigar until you are through asking for his business. To give him a cigar and then ask him what he has for you looks too much like a bribe. Another thing: a freight solicitor should never smoke while making his visits. This gives offense in many instances and by many he is thought fresh or rude.

Be courteous and carry out all your promises. If you promise a consignee that you will look up certain rates for him, give him this information at the earliest possible date, and if he is promised a map, a calendar or a picture, see that he gets it as soon as possible; otherwise he will lose confidence in you and in what you say. Keep the merchants posted as to any changes in the tariff. Treat your friends right and they will treat you right.

It is never necessary to stand for insults or abuse from a merchant. Today one of the most successful traffic men on the coast told me a story that is worth repeating:

Calling on a hard customer who had never given him any freight he was ignored; the manager started up the stairs to the second story. He was followed by the solicitor. Upon seeing him there he started for the third story, and was again followed by the freight man, and likewise up to the fourth story of his building. This was the last story, and he could go no farther. On being cornered he turned to the solicitor and said, "Well, what do you want?" The freight man answered, "I only want to be treated courteously and receive an answer to my question." The manager said, "Why don't you talk to our traffic manager?" He then took the agent to the basement and said to his subordinate, "I want you to treat this gentleman right when you ship our freight. He is a friend of mine; from now on see that he gets his share of our freight." Here was an instance of following a case through, and it eventually happened that this road received a big share of this shipper's business. The freight solicitor who got this business is now vice-president of a big system.

Another case where a solicitor made a ten strike was as follows:

There was a merchant in San Francisco who took pleasure in insulting all freight men that visited him, regardless of how polite they were, or what road they represented. One morning a new freight solicitor, who was just out from the East and trying to get acquainted in his new field, visited him. Upon handing out his card he was surprised to see the old curmudgeon tear it up and throw it into the waste-paper basket; and the door was opened for him. He left, but returned in a few minutes and the same thing was repeated. After waiting outside for ten or fifteen minutes this freight solicitor returned, with a smile on his face, and removing his hat handed the merchant his card for the third time, looked him in the eye and said, "You read that card and then put it in your pocket or desk, or I will make you eat it. I am going to teach you a lesson in manners this morning." A look of surprise came over the merchant's face. He saw that his bluff had been called

and he immediately assumed a different attitude; and ever since then he has put himself out to be friendly with and favor this man who had shown him his error.

Never tell a lie or shade your stories. I have seen railways lose all of a man's business on account of their solicitors giving him the wrong delivery date or passing record on their cars. Be a good winner and also a good loser. Only now and then can you expect to get all of a man's business. Seventy-five per cent. of the merchants like to divide their business and you can only increase your proportion of their business by showing them good service, good time and satisfactory passing records; prompt switching of cars to their spurs at destination and fair and prompt settlement of their claims. When you show them that you are watching their interests they will show you that they are with you also.

A good freight solicitor is a good judge of character or human nature and studies all his customers. What will appeal to one man will offend another. An experience which I had in my early days of freight solicitation will bear this out. I went to work as contracting freight agent for a fat, good-natured man whom everyone liked. I had previously been traveling passenger agent and did not know a reefer from a box car. After I had received a city map and had got somewhat acquainted with my territory, my new boss told me he would show me how to get freight and how to get acquainted. I made up my mind to watch very closely and to try to be a successful solicitor. The first man we visited was a commission merchant, who shipped from four to six cars of beer a month from the east to California. The first thing my new boss did was to dig the commission man in the ribs and swear at him, finally finishing up by saying: "Dan, you old stiff, I want a couple of cars of beer from you this morning, just to show this kid how to get freight." He got them; but not everyone could get away with that kind of stuff. I had to work out my own salvation in regard to approaching a man and getting away after the interview.

After securing an order covering a movement of freight by your lines, it is a good thing not to hang around too long. I have known of cases where a man spoiled his business by trying to tell two or three long funny stories after he had been successful in getting the freight. This practice very seldom makes a hit and had better be dispensed with.

Be loyal to your road and its officers and carry out its policies. If they do not coincide with your ideas, follow instructions, or quit and go with some other road. Do not knock or criticize. Praise your road, even though it be a streak of rust running from no where and ending in the bushes.

A good solicitor is always trying to discover new leads. He is on the lookout for some man who controls freight but whom the other lines are not in touch with. Many a man that makes his office in his home, or boarding house, or under his hat, controls routing on big freight. A natural freight solicitor will uncover many a good customer. More credit should be given to a solicitor of this kind than one who only follows a beaten path. A man that works for his company as though it were his own business will succeed. I remember a case of a traveling freight agent who worked hard all day in a hot Texas town without securing any business at all. He was so disappointed he could hardly eat his dinner. But he was up early the next morning and at it again; and before noon had secured some big business. Today that man is general eastern freight agent of one of our largest systems, and a successful man in his line.

Summing up the most important qualifications for a successful freight solicitor, I would say smile, tell the truth, cut out the drinks, be neat in your appearance, keep moving and don't be afraid of working hard; and some day you will find your superiors have come to the conclusion that you are too good a man for a small field, and have added to your title.



# RAILWAY BUYING AND GENERAL PROSPERITY.\*

Do the Purchases of the Roads Initiate General Business Activity, and Are They Necessary to Sustain It?

By E. B. LEIGH,

President, Chicago Railway Equipment Co.

What is the matter with general business? What can be done to restore activity? There are conclusive grounds for believing that the largest single factor in the present interruption and rapidly approaching business depression was and is the enforced and continued curtailment of railway purchases. No factor which could now be introduced into the situation would do more to stimulate general business out of its present and impending condition than a vigorous resumption of railway expenditures. This conclusion, while applying to the state of affairs at this moment, is based upon a careful study and comparison covering many years, showing the relation between railway purchases and general business.

The results of this careful and detailed analysis are presented at this time in the hope that the painful experience with which the country is afflicted and further threatened may yield us at least the dividend of knowledge upon which to base future national policies. Indeed, it has an immediate and urgent bearing upon a policy which the government is at this moment engaged in formally considering. If the conclusions drawn from past

Not many years ago, comparatively few business men, aside from those directly selling to the railways, realized that railway prosperity meant general business prosperity.

The past few years, however, have witnessed a steadily growing recognition of this fact on the part of business men generally, until today it is substantially an accepted doctrine.

There is wide-spread confusion, however, as to what constitutes "railway prosperity," often the result of the popular error of accepting the increased earnings of some particular railway, or the naturally growing gross earnings of railways generally as proclaimed by the public press, as being indicative of "railway prosperity." Much is now being written regarding decreased net earnings and the many other evidences that the railways generally are by no means prosperous in the true sense of the word, or as determined by the true tests applicable to all business enterprises.

It is believed that the watch-word "Railway Prosperity means General Business Prosperity," should be changed to read: "Railway Purchases measure General Business Prosperity."

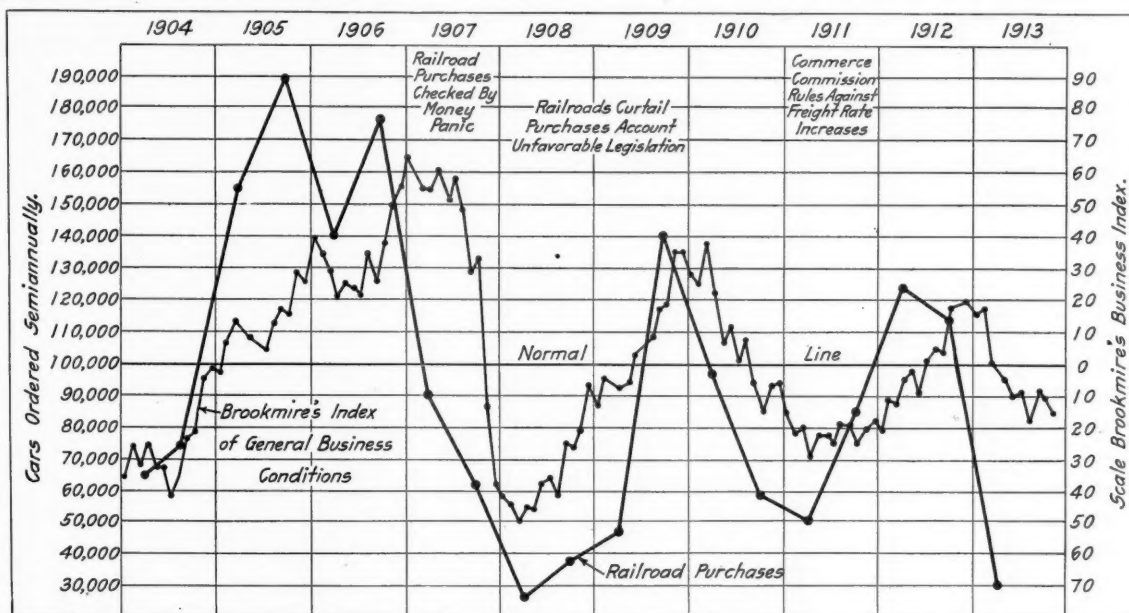


Chart Showing Relation of Railroad Purchases to General Business Conditions.

experience are correct, and if even the small advance in freight rates now asked for by the eastern railroads would enable and encourage them and other roads to make considerable outlays at once, such an outcome would directly result in a decided restoration of general business activity.

It is not for a moment proposed that railways shall be permitted advances in rates in order that unnecessary purchases may temporarily benefit the railway supply industries, or even the whole country. Waste never permanently benefits anybody. It is not unnecessary purchases which are under discussion. Railway facilities are insufficient to meet any considerable increase in tonnage. The proposition is not to over-stimulate but to remove an artificial restriction, in the shape of rates too low.

The greatest danger at this moment is delay. It is well recognized that it requires a greater force to start from inertia than to continue a momentum already established. The sooner the commission can issue a favorable decree the more certainly will the influencing power of railway purchases be effective in the restoration of general business.

Inasmuch as the railways of this country constitute its greatest industry next to that of agriculture; with but one thing to sell—transportation: the ultimate consumers of everything they buy: their purchases extending substantially throughout almost every department of business: many of them on a tremendous scale—it must be obvious how potent a factor they are in general business conditions.

As the iron and steel industry has long been recognized as being the truest index of general business conditions, and as the statement has been reliably made that the railways consume, directly and indirectly, between 40 and 50 per cent. of the iron and steel production of the country, it is manifest that the expansion or restriction of railway consumption must vitally affect this barometer.

The ramifications of railway purchases make it impossible to classify them in the aggregate. But few of the more important items, such as rails for example, are made the subject of public information and statistical compilation. However, the conditions under which rail purchases are made are not believed to be such as to reflect the railways' prosperity, or their purchasing ability, in a broad sense.

\*An address at the annual meeting of the Railway Business Association, New York City, December 11, 1913.

Many years of observation have led to the belief that of those items officially compiled, tabulated and made public, perhaps no one so clearly and typically reflects the railways' general purchasing ability as that of new equipment. When the railways are buying freely of new equipment, they are generally likewise buying freely of all other articles essential to maintenance and operation. Within the past few years the purchasing of new equipment has had a greater influence upon the iron and steel industry because of the transition from wooden to steel construction.

One branch of the writer's business being that of making and supplying a necessary article used on railway car equipment, he has been led to make a close study of the effect of railway purchases of new equipment upon general business, and long since became more than convinced that there was no one more important factor in the development of general business activity than that of the active purchasing of new equipment by the railways. He further fully believes that railway equipment purchases, with naturally attendant influence upon the great volume of other railway purchases, not only initiate general business prosperity, but are necessary to sustain such prosperity.

It has been observed for many years past that the railway supply industry has been the first to recognize, and to participate in a revival of *general business*; likewise the first to detect the signs and feel the effects of its impending decline.

It is well known in many quarters that since 1907 railway purchases have been affected (and in large measure curtailed) by causes other than those which influenced them in preceding years, chief among these being governmental control and restrictions.

It has, however, become quite apparent that since the year 1907 "railway purchases" as a factor in general business conditions have been evidenced with increasing clearness, and brought into more prominent notice by those who attempt to follow the trend of general business.

Reviewed by years, and since what is known as the "money panic" of 1907, we find the following conditions:

1908.—The year 1908 was notably the leanest of business years, notwithstanding bountiful crops and plentiful money. It was likewise the year in which the smallest number of cars were ordered, namely, 62,999, and the minimum of railway purchases made for many years.

1909.—The conditions of 1908 were continued well into 1909, but the last half of the year witnessed a substantial buying movement by the railways, the total cars ordered for the year aggregating 193,874, nearly 70 per cent. of which, however, were ordered within the last four months, with particularly heavy orders in November and December. This gave a fairly good business year, with a heavy "carry over" in 1910.

1910.—General business promptly followed, and with the heavy "carry over" business from 1909 referred to, coupled with fairly good buying on the part of the railways during the first six months, made the year 1910 a still better year than 1909, although the total of car purchases was only 145,085. The falling off in car orders after the middle of the year was duly reflected in the decline of business until at the end of 1910 the probabilities of 1911 were clearly foreshadowed.

1911.—The decline in general business, together with the falling off of railway purchases continued throughout almost the entire year; but at its close a buying movement on the part of the railways set in. The total number of cars ordered for the year was 135,740, nearly 30 per cent. of which was placed at the very end of the year, and necessarily carried forward into 1912.

1912.—We reached a high point in railway purchases about May, 1912, continuing with normal purchases for most of the remainder of the year, again reaching a high point at the very end of the last quarter, the total car purchases being 238,400, the largest number in any year since 1906. It is here significant

to note that the foregoing conditions in railway purchases were followed by a phenomenal revival of general business during the last half of 1912—this, too, in the face of a national election fraught with more uncertainties as to its outcome than any we have had for years. Business seemed to ignore these conditions, however, while the heavy purchases made by the railways filled the steel mills of the country with orders toward the close of the year, so overtaxing their capacity as to compel buyers to anticipate deliveries by orders placed four, six and even nine months in advance of shipping dates—a condition heretofore unprecedented—while general business assumed almost the aspect of a boom.

1913.—The heavy purchases of new equipment continued during the first three months, but sharply declined at the beginning of the second half of the year—almost immediately sinking to the lowest level reached these several years. It was here that the "danger signal" was set by this barometer; but naturally general business did not immediately feel this falling off of railway purchases at the time (because of the accumulations) nor in fact until quite recently, being sustained by the "unfilled orders" on hand, or what may properly be termed the "unspent momentum." The conditions clearly foreshadowed at the middle of the year, and accentuated every month since, are now upon us, and what have we to look forward to after January 1, 1914? If the railways do not resume purchasing on a fairly liberal scale, we are certainly facing a very depressed business situation.

It is believed that the great majority of business men have failed to recognize the real situation, and that the now noticeable decline in business is being attributed to other causes.

Had the railways been granted the 5 per cent. advance in freight rates which they sought last June, it would not only have restored great confidence in railway credit, but would undoubtedly have been followed by a buying movement which, if on but an average scale and within the limitations of money conditions, would have so far reinforced the large volume of "unfilled tonnage" as to have obscured the several now existing uncertain elements, just as these same elements (when in prospect) were practically ignored during the latter part of the year 1912 and the early part of 1913.

The illustrations given above are believed to be sufficiently significant, if not conclusive. They may be carried back over any number of years, and with the same result shown. Is it merely coincidence, or is it cause and effect?

While financial or money conditions are essentially fundamental to "railway purchases" as well as to every business enterprise, nevertheless, anything which affects "railway purchases," be it lack of money, inability to secure it on favorable terms, or unwillingness to use it, must work to the same common result.

If the iron and steel industry, heretofore broadly recognized as the great barometer of general business conditions, and as basic to them, is dependent upon "railway purchases" to the extent of the absorption of 40 to 50 per cent. of its production, how much more really basic are "railway purchases" as the initial force in starting and sustaining the circulation of general business? Are they not manifestly the pulse of general business?

It is confidently believed that the sooner this country, as a whole, recognizes this basic relation of "railway purchases," the sooner we will deal intelligently with this controlling factor.

In conclusion, one prominent thought is urged, namely, that it is not the railway supply industry alone that is so vitally affected by "railway purchases," as generally supposed. From its nature, the railway supply industry is logically the first to feel their effects; but every business interest, every business man, large and small, and all those dependent upon them, are each in turn affected, favorably or unfavorably, by the relation undoubtedly existing between "railway purchases" and "general business prosperity."



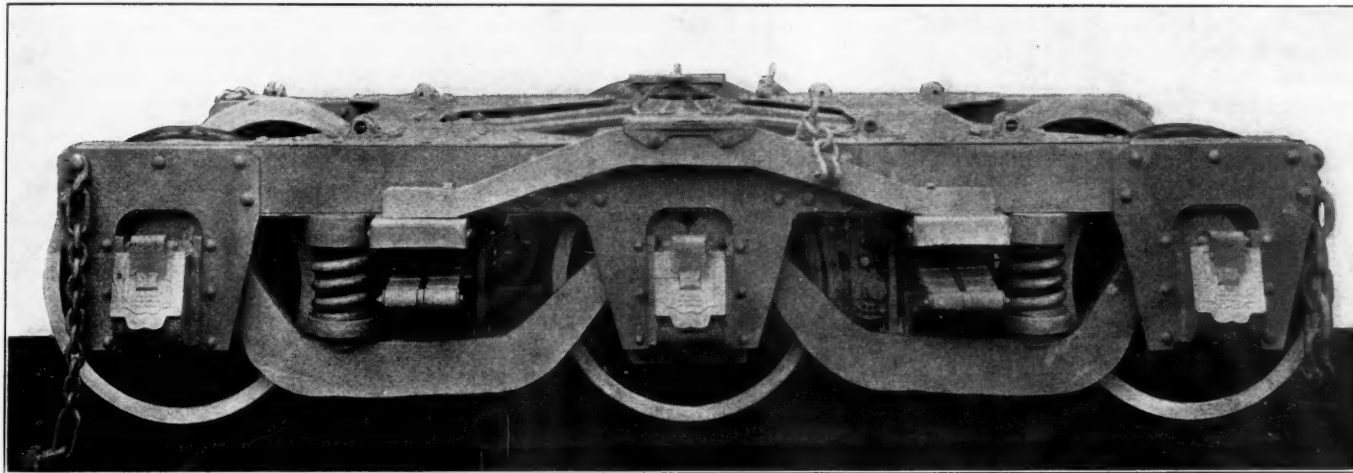
## CANADIAN PACIFIC ALL-STEEL TRUCKS.

Within the past few years a number of railways have adopted all-steel trucks for service under heavy passenger train equipment. The Canadian Pacific has in use a type of four and six-wheel steel truck that was designed by the general master car builder, R. W. Burnett. The general appearance of the two trucks is clearly shown by the illustrations from photographs, while the details of the construction of the six wheel truck are illustrated by the line engraving.

One of the points about the truck that at once attract attention is the smooth straight line external appearance with the omission of the usual end pieces. The absence of the end pieces gives a better clearance for the car steps and allows a better op-

are made of flat plates which are first punched approximately to shape, and then milled to the exact size. In designing the truck, it was expected that these pedestals would bend in case of a derailment, but that they could easily be bent back again into shape. Experience, however, has shown that whenever a derailment has occurred the pedestals have not been distorted and it has been possible to carry the car body to the shops on its own trucks.

For wearing strips, chilled cast iron liners are riveted to the jaws, and these have shown wearing qualities superior to anything else that has been tried. Neither liner nor box has yet shown any appreciable wear and the indications are that both will run indefinitely. At the bottom, the jaws are tied together by a short pedestal tie bar held in place by a pin, fitted with cotters and without bolts or nuts. To remove a pair of wheels,



All-Steel Six-Wheel Truck for Passenger Equipment; Canadian Pacific.

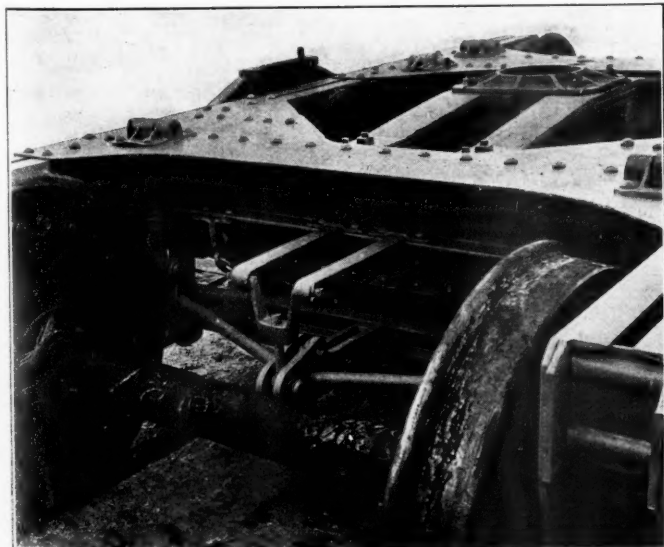
portunity not only to strengthen the draft rigging but to inspect and maintain it. On the end toward the center of the car there is a better opportunity to install the axle light apparatus.

The side beams consist of two 8 in. channels, with their flanges toward each other. They are riveted together with spacing blocks between so that they present a smooth surface on the outside. The two beams thus formed are tied together by Z bar transoms and straight gusset plates extending all the way across the truck of both the top and bottom of the channels. At the pedestals the lower flanges of the channels are cut away to admit the equalizers and are, at the same time, stiffened by the pedestal plates. These

all that is required is to take out two cotters for each pair of wheels, pull out the pins and lift the frame.

The absence of the end pieces necessitated the use of inside hung brake beams, and these are installed without any retracting springs, but with a special brake beam adjuster. This is very clearly shown in the enlarged end view of the six-wheel truck. It consists of a hanger carried by arms riveted to the transom. Into the bottom of this hanger is screwed the carrier that supports the truss of the brake beam. No check nut or cotter is required to hold it in place, as it cannot turn and the adjustment is effected by removing the pin from the brake beam, screwing the carrier to the proper position and replacing it in the beam.

Bolts and nuts are avoided and one of the arrangements for



End View Showing the Brake Beam Adjuster and the Absence of the End Piece.



Four-Wheel All-Steel Passenger Truck.

doing this is to be found in the bracket for the spring plank hangers. It will be seen that these are on top of the gusset plates. They are simple castings with a seat for the hanger pin. This pin is held in place by a wall over the hole at one





end and a cotter pin put across the hole at the other end. To remove the pin, a hole is left in the wall, through which a drift can be pushed or driven.

In spite of the substantial appearance and actual strength of these trucks they are lighter than the composite trucks which they replace.

## GOVERNMENT OWNERSHIP AND THE RAILWAY EMPLOYEE.\*

By J. K. TURNER.

The ringing chorus of "Safety First" has now filled the ears of America's army of railroad men for several years. What is the meaning of "Safety First" to the railroad man? First, his life, health, and comfort. Second, his job. The railroad employees of the country have recognized the first meaning of "Safety First." But they have forgotten the second.

If "Safety First" means anything to the American railroad employee, it means not only the safety of his life, his body, his home, his comfort, but it means the safety of his job.

The railroad man stands today in peril of losing the freedom of action which has hitherto been such a marked characteristic of his place in the industrial scheme of things. Why? Because the railroads of the United States are today on the brink of government ownership, a condition which would sweep out of the grasp of railroad employees the broad liberties they now possess.

The biggest question before all railroad employees of all railroads of the country to consider now, before it is too late, is this: Do you want government ownership of American railroads?

For years, government ownership has hung in the horizon's mists—to some a gleaming light of hopeful promises, to others a cloudy star of menace.

Today you can no longer dismiss the thought of government ownership with light unconcern. The crisis is here. You stand at the parting of the ways. Which way shall it be? Some railroad heads predict government ownership within a year. All declare that it will come quickly unless the present trend of affairs is decisively headed off.

Contrast the lot of the railway mail clerk, a government employee, with that of the trainman, an employee of private management. The comparison will throw searching light upon the subject.

The railway mail clerk starts at a minimum wage of \$60 a month. He is often required to work long after his regular hours. He receives no pay for overtime. His hours often average twice those of the trainman. The mail clerk is under civil service regulations, and is required to take frequent examinations on new routings, new territories, and the like. He must prepare for these examinations while off duty. He must take these examinations on his own time. Mail routings are changed with great frequency, thus upsetting the value of his previous knowledge, and requiring intense application and high pressure study to master the details of new routings.

A foreman of railway mail clerks is paid \$150 a month. Promotions beyond this position are very difficult for a mail clerk to secure. The higher positions in the service are almost entirely politically appointive.

And finally, railway mail clerks are not permitted to organize for the purpose of bargaining with their employer direct for wage increases or for bettering their working conditions. They may only take the matter up with their congressmen, an act of Congress being imperative before any changes can be effected. Nor may government employees strike, no matter what their grievances. To strike under these conditions is treason.

Remember what happened in France. The government took over the railroads, and incidentally made all railroad employees

part of the national guard. In time, M. Briand, himself a labor leader, became France's premier. The railroad men got into a squabble with the government, and went on strike. Premier Briand was forced to put rifles into the hands of the strikers, thus turning the strikers themselves into strike breakers.

Consider, in turn, the lot of the trainmen under private ownership of American railroads. The eastern trainmen, under the new wage ruling, start at minimum wages of \$78 and \$76.50, the former figure applying to rear brakemen, and the latter to others. These figures are exclusive of overtime. Overtime rates are 26 and 25½ cents per hour respectively for these classes of service. Overtime is allowed after eight hours of work within 12 hours. Lay-overs of less than one hour are not deducted.

Under the present system, railroad employees may bargain direct with the employer as to wage increases, better working conditions, and the like. The grievance committee has the privilege of going direct to the officials at any time with any grievance whatever. There is no red tape to involve delays. For back of every grievance, every wage request, every request for improvement of conditions is the banded power of an army of workmen, standing firmly on the platform of collective bargaining.

Time and again we have beheld the successful culmination of railroad employees' demands, even in the face of greatest odds.

We have seen repeated wage increases for railroad workmen, while at the same time the Interstate Commerce Commission refused the railroads the right to advance their rates slightly.

The power that won for the banded employees their demands can remain a living force, however, only so long as private management of railways exists.

Let government ownership come, and immediately banded railroad labor's strength will vanish in the twinkling of an eye. And if the government then decided to place trainmen's pay on a par with that of its mail clerks, the trainmen would have no redress, save that of carrying their grievances to Congress. And once such grievances got tied up in the red tape of congressional action, none can tell what the outcome would be.

Does the railroad man regard his chances for comfort of mind and stability of position as better under the present system than it could be under government ownership, or does he believe that the reverse is true?

Under present conditions, the country is suffering from hardening of the arteries. The paralyzing effect of this condition is beginning to be felt severely. It must be headed off. The railroads, having been refused permission to economize to fit their pocketbooks, are in direst need of the small rate increase they request. Otherwise they will fall farther and farther into the state of obsolete inadequacy which is laying hold of the tools of the country's commerce.

You may say that it is no concern of yours if the Interstate Commerce Commission sees fit to deny the railroads the rate advance. But it is a very vital concern of yours. Its denial will mean government ownership just that much closer. It will overtake the weak roads first and the strongest roads eventually. There will be no escape.

Railroad labor and its minor officials will be the first to suffer under government ownership. The railroad heads have much less to worry about. For their experience and ability will win them managerial positions on the railroads under the new order.

Railroad heads are worrying not for themselves, but for the men lower in the ranks. They are responsible for your welfare. They have the keenest anxiety for your future, your comfort, your happiness, and your homes. You may not believe this. If not, it is only because you have never been an employer of labor. If you ever become one, this statement will come back to you. You will then understand its truth.

Talk to your banker and storekeeper. Ask them what they think they can gain under government ownership of railroads. Perhaps they are complaining of shipping conditions as they are

\* Abstract of an article in *The Mediator*.

today. Yet will conditions not be far worse under government ownership?

Inadequate as are the railway facilities of our own privately owned railroads, are conditions as bad as in England, France, Germany, and New Zealand, under government ownership? It is reported that in New South Wales, the proportion of gross receipts carried to the surplus account fell from 12.97 per cent. in 1907 to 2.77 per cent. last year. Does that indicate good management?

Again, the net return on capital invested in Australian government railways last fiscal year fell to 3.56 per cent., against 4.09 per cent. in 1912, and 5.22 in 1911. Does this indicate that government ownership of railways is successful in that country?

France, Germany, and England, with their government owned railways, have faced increasing lack of adequate facilities ever since the new order became effective. The red tape that surrounds railway officials and binds the whole systems is abhorrent to the American ideals of facility and despatch.

But it is argued that this is America, and that government ownership would be a very different story here. Let us see. Did you ever have a new post office building constructed in your vicinity? Did you observe how much longer it took to build than the privately built edifices? Wasn't it true that by the time the post office was completed it usually turned out to be too small for the requirements? Was this efficiency? Was it good business? Would a private business man have tolerated the delays and wasteful expenditure, such, for instance, as building a four-story federal building in a two-story town?

When election day came around again, didn't you hear your congressman boast that he got the government to spend the lavish sum the post office building cost? Hardly a congressman but has made these boasts, demanding re-election in return for the government's money he succeeded in squandering.

In Washington you may see numerous government offices installed in rented office buildings of ramshackle and unsafe construction, simply because some landlord has enough official influence to rent the government such premises at an extravagant figure. Is this efficiency? Is it good business?

And yet the government is honeycombed with these practices. And now it makes the inferential threat that it will take over the railroads and attempt to run them, that it will take them away from railroad managers who have devoted their lives to the profession of railroading, men who, coming up from the very bottom in most cases, have been trained under the sharpest and intensest competitive conditions into capable and proficient railroad managers, and that it will turn them over to a lot of politicians to run!

For these reasons every man on every railroad should do his share to discourage government ownership of railroads. He should talk to the people of his community, in the stores, shops, streets and homes, where public opinion is made.

Every railroad man should constitute himself a committee of one to talk to his butcher, his grocer, his baker, about these matters. He should talk to the editor of his newspaper, to his preacher, doctor, lawyer, dentist, mayor, and alderman. What these people think and say makes public opinion, the most powerful force in the history of all the world, and the only force that can save this country from a calamity like government ownership of its railroad arteries.

It is the business of railroad employees of every rank at this time to inform that portion of the public nearest them what railroad baiting means. It means tightening of trade, credit, and prosperity, and none can escape the harm. It is a community question. Its effect falls upon every inhabitant of the country.

Ask your banker who is the best depositor of savings—the government employed post office clerk, or the trainman, engineer, or fireman of the privately owned railroad?

Who is the better citizen—the post office clerk, or the railroad man?

Who is worth more to the community—the postmaster or the division superintendent of a railroad? Does not the former hold his position by dint of political influence, while the latter got there by hard, intelligent and faithful service alone?

And observe, if you are a railroad man, that in case of injury in your work, should government ownership come, you cannot sue the government, without the government's consent. Inform your community that neither could a traveler, hurt in a wreck, sue the government for damages without the government's consent.

Who ever heard of the government establishing for its employees old age pensions, workman's compensation, and similar benefits? True, the politicians will promise all these things. But how many politicians' promises, in your experience, have you seen kept?

The argument, in short, is overwhelming in favor of private ownership, with proper regulation, of our railroads. They are fighting a hard fight. They need your help. It is to your personal interest to save the railroads from government ownership. You have a definite part to play in bringing the sober judgment of the country to assert itself.

Government ownership would be a wasteful experiment. Undoubtedly private ownership, after a few years, would be again in universal demand. In view of the world-wide present demand for capital, the nation's credit would be found insufficient to meet the pressing demands from every part of this large and growing country to improve living and agricultural conditions, foster commerce, and meet the demands of progress.

Strict and intelligent state and national regulation, under private ownership, can and must solve the problem. Government ownership would be purely punitive, and punishment costs terrifically and yields no proportionate returns.

Railroad men, the time is here for you to act. Start creating sober, intelligent public opinion today.

**MANCHURIAN RAILWAY CONSTRUCTS SILK FACTORY.**—The South Manchuria will have completed, before the end of the year the construction of a tussah filature, or raw silk reeling establishment, and a dyeing and weaving factory. The latter will start with a force of trained Japanese and Chinese workmen. Weaving by hand, which is usual in China and Japan, will be tried first, but the importation of modern machinery is now under consideration for inclusion in the estimate of the railway expenditure for the coming fiscal year. About \$15,000 worth of wild silk cocoons have already been purchased for use at the filature during the ensuing year, and \$35,000 worth of tussah silk has been purchased from other filatures for practical experimental purposes.

**BRITISH RAILWAY CONSTABLES AND TRADE UNIONS.**—An important question has arisen between the London & Southwestern and certain of its railway police, as to whether they shall be allowed to join the National Union of Railway men, and the matter is still under discussion. It appears that about 60 constables have joined the union with the object of improving their conditions of service. Their position is somewhat peculiar, as they have sworn to preserve the peace, and the company's attitude is that if the constables belong to the union and a strike or disturbance arises in which union men are engaged, it will be difficult for them to carry out their oath. Again, if a strike were declared by the union these constables would in all probability have to go out with the others. The company has accordingly pointed out that if the men persist in their union membership they must be transferred to some other branch of the service. The constables declare that they have never discussed the question of going out on strike, and that they had not attempted to raise the question of wages. Their complaint refers mainly to the hours of duty, and they maintain that they have only joined the union as a measure of self-protection.



# NEW DEVICES FOR THE CAR DEPARTMENT.

Link Side Bearing Used With a Bolsterless Truck—A  
Coupler Release Rigging—A Collapsible Stake Pocket.

Details of freight car design are receiving more and more attention; the three devices described in the following article reflect the variety of the designs which are being suggested and, to some extent, the refinements to which the work is being carried in the effort to secure the greatest possible efficiency from the equipment.

## LINK SIDE BEARING TRUCK.

It has frequently been claimed that the principle of transferring the weight of a car to the trucks through a loaded center plate is wrong, and that it is useless trying to balance a load of 100,000 to 200,000 lbs. on two central points at each end of the car. This

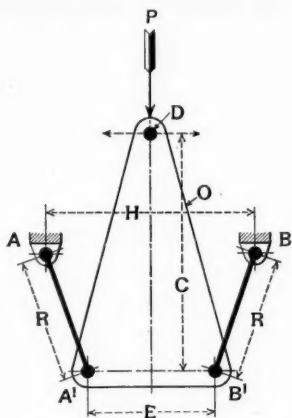


Fig. 1—Diagram of Link Side Bearing.

has led to the design of trucks which support the load of the car by links or similar construction on each side frame.\*

Fig. 1 illustrates the general principle of a link motion device of this type that has been designed by A. Stoikowitz, of Montreal, Que. *A* and *B* represent fulcrum points for the links *R* which support oscillator *O* at points *A'* and *B'*. Point *D* will travel on a straight line, when certain approximate proportions between the dimensions *R*, *H*, *E*, and *C* are met. The movement of point *D* denotes the side bearing travel which is comparatively small, and as the angular movement of the pivot points is correspondingly small and lever *C* is greater than *R*, the frictional resistance resulting from these points will be small and can be safely neglected. As the load is being carried on what might be called a floating support, the oscillator *O* provides for a nearly frictionless horizontal and radial truck movement on a curve (Figs. 2 and 3), while the links or hangers *R* also allow sufficient lateral movement of the car body, as is the case in a swing motion truck. Furthermore if *D* is pivoted

\*For description of the Summers side bearing truck, see *Railway Age Gazette*, March 22, 1912, pages 677-680.

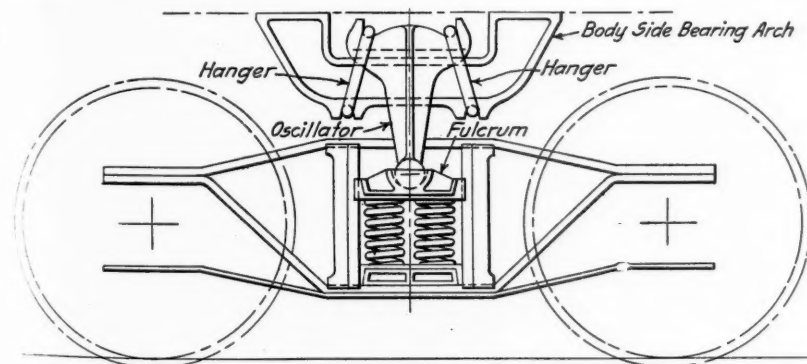


Fig. 3—Standard Truck with Weight of Body Transferred Through the Side Bearings.

to its fulcrum by a pin, it will form an effective anti-telescoping device, as, in case of an accident, it will prevent the cars being lifted from their respective trucks.

Fig. 2 shows the application of this device to a six-wheel passenger truck; the oscillator is U shaped and straddles the side bearing arch as shown; the hangers are of the solid link type and engage both the oscillator and the side bearing arch. The anti-telescoping feature is applied by pivoting the top of the oscillator to the side bearing fulcrum by means of a 2 in. pin. This pin is under double shear and would require an enormous force to tear a truck from its body, provided all the details involved are of equal or greater strength.

Fig. 3 illustrates a standard arch bar truck with bolsters and

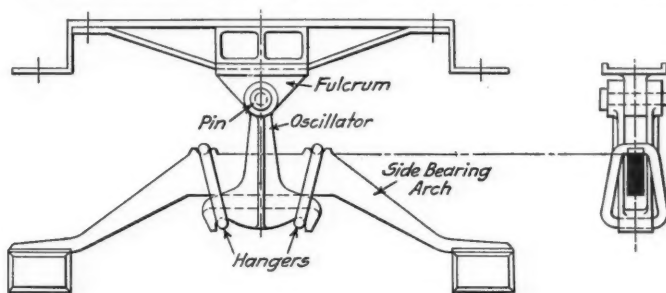
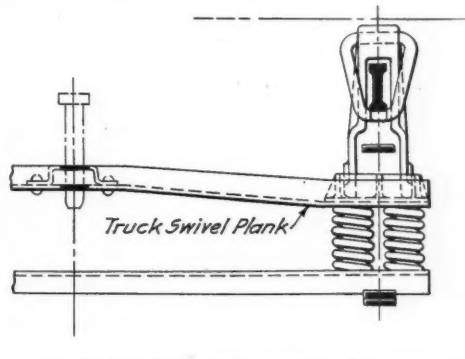


Fig. 2—Application of Link Device to Six-Wheel Truck.

center plates eliminated and the entire load carried by the side bearings only. A truck swivel plank is substituted for the bolster to provide a swivel point for the truck center. The side bearing fulcrums are riveted to the swivel plank and placed over the truck springs, which arrangement transmits the load directly to the side frames. The king pin hole in the swivel plank is slotted to allow a lateral movement of the car body on the link hangers, thereby embodying the general features of a swing motion truck.

Fig. 4 shows the application of this link motion principle as an ordinary side bearing, which is secured to the truck bolster and intended to replace the common plate or roller side bearing. As dirt has no effect on this side bearing the design can be entirely open; in fact it admits a great variety in the construction of hangers, oscillator or base, depending on the conditions.

In order to prove the theoretical correctness of a bolsterless truck, Mr. Stoikowitz analyzes three cases to which any truck bolster is subjected caused by the different conditions of service. Referring to Fig. 5, there is a clearance between both side bearings; the load is being carried by the center plates only. Undoubtedly this case requires a bolster capable of supporting a concentrated load *P* at its center and should be sufficiently rigid



to maintain clearance  $F$  under all conditions of service. As this clearance will vary from  $\frac{1}{8}$  in. to  $\frac{1}{2}$  in., it is evident that the rocking motion of the car body is directly proportional to twice this clearance, which will produce an unfavorable pounding action on side bearings and truck springs.

Fig. 6 represents a common condition to be found on cars after they have been some time in service and illustrates the obvious uselessness of a bolster strong enough to support a concentrated load. There is no clearance between side bearings, caused either by the deflection of the truck bolster, the body bolster or both, by defective center plates or by many other causes. Evidently this case fails to make use of the total carrying capacity of the bolster in a proportion, as the central force

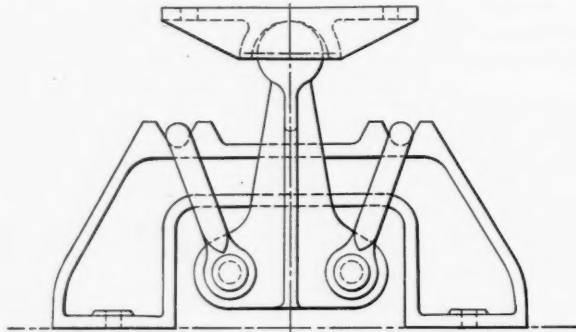


Fig. 4—Link Principle Applied to Ordinary Side Bearing.

$A$  decreases and the two side forces  $B$  increase. As the distance  $E$  is small compared with distance  $D$ , and considering the worst case of  $B = \frac{P}{2}$ , the resulting bending moment for this point,

being  $\frac{PE}{2}$ , is very small as compared with the bending moment

in Fig. 5, which is  $\frac{PL}{4}$ . But as there is no clearance between

the side bearings, the rocking tendency of the car body is greatly retarded or absorbed by the truck springs.

Fig. 7 shows the load unequally distributed and has the same general properties as Fig. 6, with the additional disadvantage of compressing the truck springs unevenly; that is, reaction  $R_1$  will be greater than reaction  $R_2$ . It has been attempted by the use of some cradle arrangement to throw a proportionate part of the load toward the light side, but the theoretical correctness of such an arrangement is questioned; the only remedy is equal distribution of load.

Fig. 8 represents the idea of supporting the load directly over the truck springs, thus eliminating truck bolsters and center plates. As there is no side bearing clearance, the rocking tendency of the car body and the resulting pounding action are greatly retarded. With the load unequally distributed it is equivalent to the case shown in Fig. 7 in compressing the truck springs unevenly, but this condition will happen in exceptional

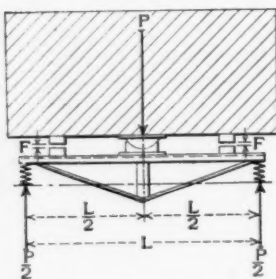


Fig. 5.

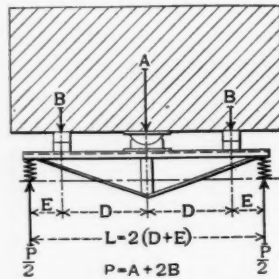


Fig. 6.

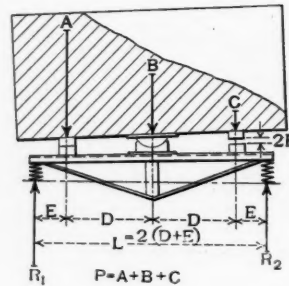


Fig. 7.

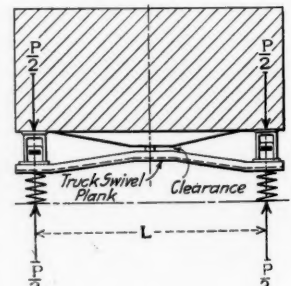


Fig. 8.

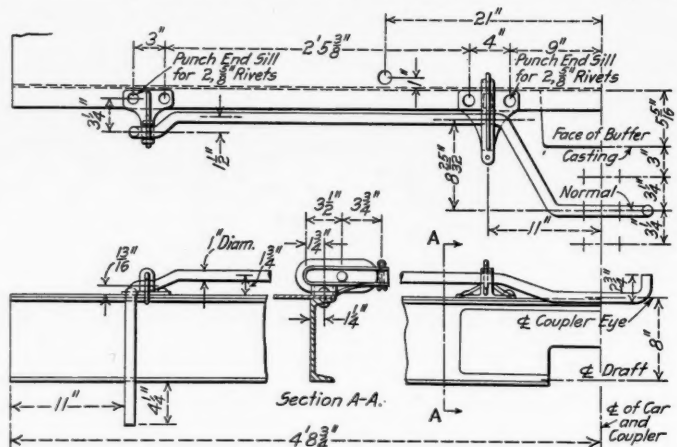
cases only and will have no appreciable effect upon this bolsterless truck.

Some of the general advantages claimed for this link side bearing in connection with a bolsterless truck are that it solves in a simple manner the side bearing problem, and that when applied to freight trucks it will reduce the dead weight of each car and reduce the wheel flange and rail wear with a corresponding decrease in draft resistance and chance of derailments. When applied to passenger equipment, it gives a nearly frictionless side bearing combined with an anti-telescoping device.

Patents have been applied for on this design by A. Stoikowitz, Montreal, Que. It is manufactured by the Link Side Bearing Company, 314 Hammond building, Hammond, Ind.

#### COUPLER RELEASE RIGGING.

The release rigging shown in the illustrations employs a minimum number of parts to operate the uncoupling mechanism of an M. C. B. top lift coupler. This device consists of an operating lever of 1 in. round bar, bent to the shape shown, and two malleable iron brackets riveted to the end sill. The side movement of the coupler head is allowed by the slip connection of the lever in the eye of the coupler lock and the draft gear movement by the slot in the bracket located nearest the coupler,



National Coupler Release Rigging.

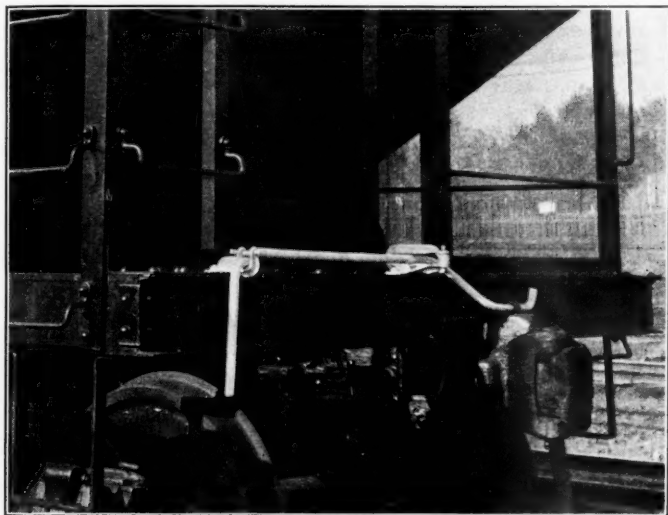
with the outer bracket acting as the center of rotation. When releasing the coupler by hand, the operating lever rotates in the two brackets and the movable bearing in the inside bracket allows an adjustment so that the coupler lock is lifted at the angle which is the best suited to the particular type of coupler being operated.

It will be seen that the lever has a three point bearing, viz.: in each of the two brackets and in the coupler lock eye. This obviates the necessity of setting the lever handle back against the sill face to prevent sagging of the reach arm and makes it possible to design the lever with a good clearance between the handle and the sill face. In this way the handle is allowed to accommodate itself, in the case of interchange coupler applications, to the difference in the height of the eye of the coupler lock as well as the cases where the coupler sags from its original position.



It will be noticed that the lever has a limited movement in this bracket so that an abnormal forward movement of the coupler, as in the case of the coupler becoming detached from the draft gear, will result in the lever tending to unlock the coupler and release the adjoining car, preventing the coupler from being entirely pulled out of the end sill and falling to the track.

It will be noted that the lever is simply a 1 in. round steel bar from end to end, bent to fit the particular car to which it is applied. In case it becomes distorted in service, the removal of the two cotter pins which hold the lever in the brackets will allow it to be disconnected from the car. By using the lever on



Coupler Release Rigging on a Hopper Car.

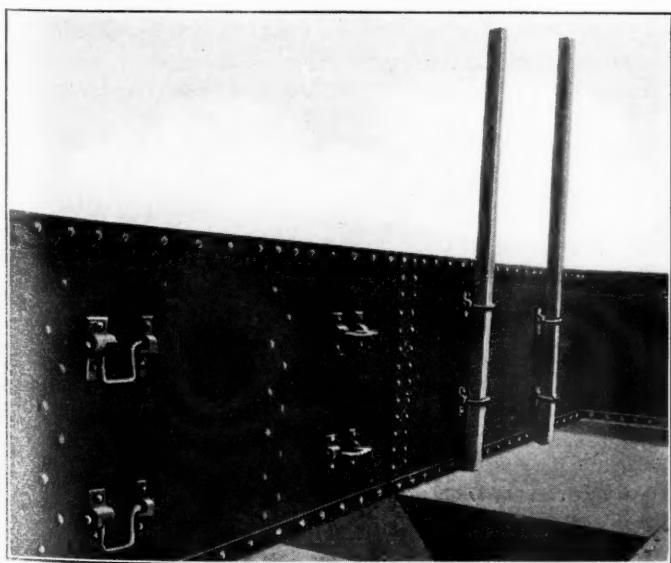
the opposite end of the car as a pattern, it is an easy matter to bend it back to its original shape without the use of any special dies.

There is a slight offset in the operating lever near the outside bracket which holds it in the same position laterally at all times, thus insuring the desired amount of forward and backward movement within the slotted bracket.

This rigging is manufactured by the National Railway Devices Company, 490 Old Colony building, Chicago, Ill.

#### IMPROVED STAKE POCKET.

A new stake holding device for freight cars has recently been developed by the U. S. Metal and Manufacturing Company, New



Collapsible Stake Pocket Applied to a Car.

York. The device can be applied to a car in the position where the strap or cast pocket is now attached. The advantages claimed for this type of stake pocket are, that when not in use it drops to the side of the car, thereby increasing the inside width of the car for such forms of lading as lumber, structural shapes, piping, pig-iron, etc., and it also prevents damage to the pockets or lading in loading and unloading. When loading material which requires stakes, the pockets are raised to a horizontal position and moved to the rest lug on the right, after which the stakes are applied. The pockets are strong, of simple construction and always available for stakes of M. C. B. dimensions. A large percentage of the old type pockets are constantly out of repairs; they are expensive to maintain and facilities for repairs are not provided at loading points, resulting in improperly applied stakes or the use of stakes that do not meet M. C. B. requirements. It is claimed that the breaking load of the stake over the round section of this pocket is 18 per cent. greater than that over the square edge of the strap pocket. The round section also makes the driving of the stake easier, as well as more secure. The pockets have been thoroughly tested out in actual service for over a year with excellent results.

#### YOUNG LOCOMOTIVE SUPERHEATER.

Following the lines of simplicity generally found in American locomotive design, a new fire tube type of locomotive superheater has been designed which eliminates a number of the parts generally found in the designs now in use. It is so arranged that any required number of double loop pipes may be entered in the enlarged boiler flues set in a horizontal row across the upper two-thirds of the boiler in accordance with the practice which has developed the highest degree of superheat for the smallest amount of superheating surface. The two ends of each individual unit are connected to a steel plate header located near the top of the front end and integral with the front tube sheet, by an expanded joint in the same way that the boiler tubes are joined to the front tube sheet. This header has two compartments, one for saturated and the other for superheated steam and one end of each unit connects to each compartment. The entire superheater is encased in a steel plate box provided with a damper in the bottom to divert the gases from the superheater portion as desired.

This construction provides for a superheater which is integral with the boiler, and is applied and maintained by means common to boiler construction and may be properly maintained by a class of labor skilled only in boiler work. There are six features of special interest to be noted in this construction. These are the use of a small steel plate header of the drum type which does not require the use of stays; the connecting of the ends of the unit pipe to the header by means of the usual tube expanded joint; the substitution of welded return bends at the ends of the loops in the unit pipes for cast steel return bends; the arrangement of units so that any one can be removed with the removal of but one other if in the upper rows and no other if in the bottom rows; the construction which permits the removal of the dry pipe without disturbing the superheater header or units, and the arrangement for tightening the unit pipes to the header without disturbing any of the front end apparatus or appliances.

The header is in the form of a drum and is secured in place on the front tube sheet in the location occupied by a tee head in a saturated steam locomotive. It has a steam tight connection to the end of the dry pipe as is shown in the illustration. The plate dividing it in two compartments is welded in place and contains an opening or manhole of a size to permit the dry pipe to pass through it. This opening is closed by a specially constructed sealed cover, which can be removed when the tee head has been taken down. There is a reinforcing plate at the front face of the drum and the tee

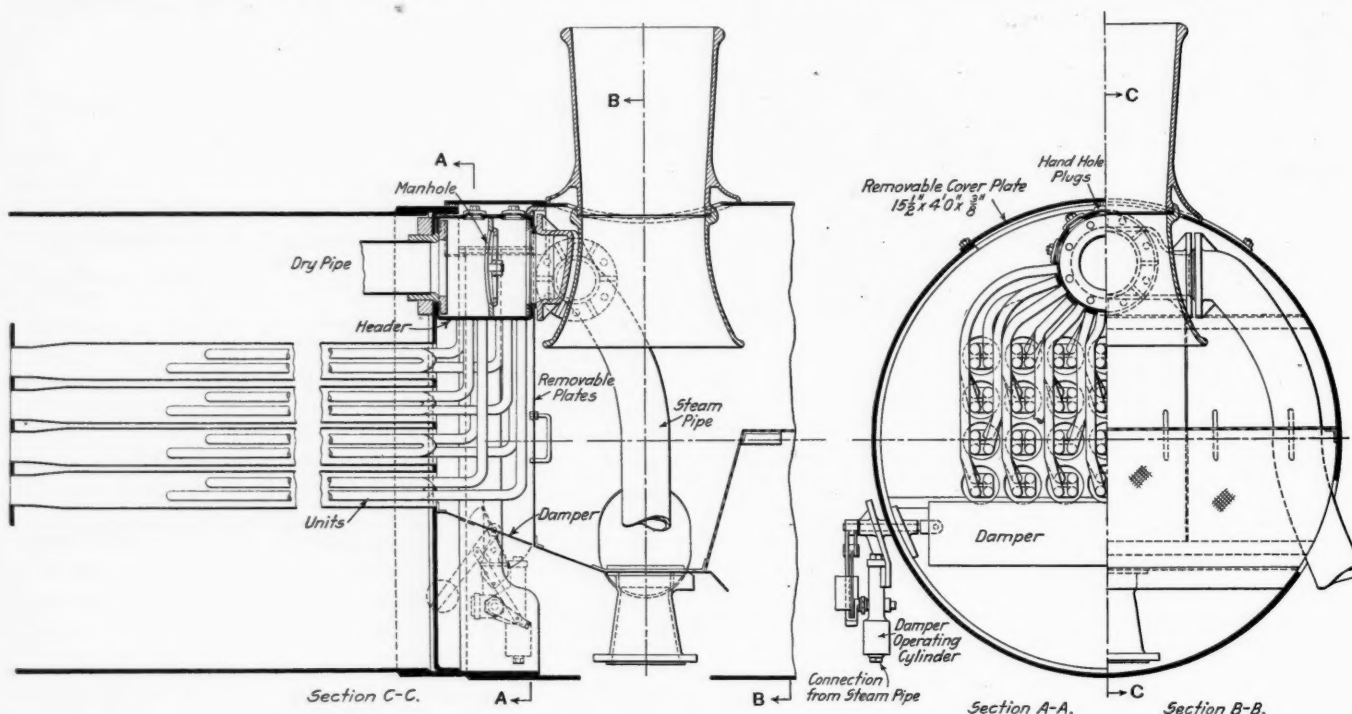
head connects to it with a ground joint of the usual type. The tee head is arranged for connections to the steam pipes which lie in a vertical plane parallel to the center of the boiler and will allow the removal of the head without disturbing the lower connections of the steam pipes. The holes in the bottom of the header for connection to the unit pipes are formed the same as the boiler tube holes in the front tube sheet and the unit pipes are connected to them in the same manner as boiler tubes by means of a Prosser or roller expander. Beading, of course, is not necessary, as there is but little tendency for them to pull out and it is only necessary to make a steam tight joint. There are hand holes in the upper part of each of the compartments, that are closed by a special type of hand hole plug which can be inserted from the outside and is sealed by a copper gasket or ring. This type of plug has been in successful use on superheaters in stationary practice for many years. Above the whole header a section of the front end sheet is cut out and fitted with a removable cover plate which will give access to the top of

and it is also possible to remove unit pipes from either of the top rows by the removal of one other unit. If a unit is removed by cutting off, the slight loss in length is made up by changing the position of one of the bends slightly. This can be done cold without damage to the pipes. The flue pusher method of removal, however, is to be preferred.

In place of using cast steel return bends with the unit pipes screwed or welded in place, this design employs a welded joint between the two sections of pipes. This joint is made by first bending the ends of the pipe to an angle of about 45 deg. and then sawing them off on a line parallel to the axis. These two parts are then brought together and electrically welded. This construction is used at all of the return bends.

The damper operating mechanism is of the customary form which closes the damper by means of a counter weight when the throttle is closed and opens it only by steam pressure on the opening of the throttle.

Removable plates are arranged in the front of the damper



Sections Showing Small Header and the Arrangement of the Units of the Young Superheater.

the header from the outside of the locomotive. In addition to the hand holes in the upper part of the header there are also small openings diametrically opposite the entrance of each of the unit pipes. These are closed with a small plug, of a design similar to the special hand hole plug already referred to.

The method of inserting a unit is to remove one of the hand holes and the small plugs from the openings directly opposite the two joints. A Prosser or roller expander is then inserted in the hand hole and properly placed and an extension is inserted through the small opening and connected to the roller. An air drill or hammer can then be used on the outside and the joints properly made.

When it is necessary to remove a unit, either of two methods can be used. A flue cutter can be inserted in the same manner as the expander and the pipe is cut off even with the joint, or a flue pusher can be used, pushing the flue from the sheet. The ends, in the latter case, are swedged down to a gage below the size of the hole before being replaced.

As will be seen in the illustration, the vertical sections of each of the unit pipes at the front are offset to each side and so arranged that it is possible to remove the units from the two bottom rows without interfering with any of the others

box to facilitate cleaning and the removal or examination of any of the connections.

This superheater is being built by the Power Specialty Company, 111 Broadway, New York.

**NARROW ESCAPE OF A SPANISH TRAIN.**—On November 21 the Sud express, which runs from Paris to Madrid, narrowly escaped serious damage. As the train was passing through the Cazorla tunnel a part of the roof collapsed and two of the rear coaches were damaged by the falling debris. A brakeman was injured and four of the passengers complained of shock.

**ELIMINATION OF GRADE CROSSINGS IN GERMANY.**—The railway administrations of Germany are pursuing a consistent policy of grade crossing elimination, and work on the elevation of railroad tracks is everywhere to be observed, especially in and about the cities. The present laws relating to grade crossings are very strict. In Prussia, for example, all highway crossings on main lines must be protected by gates. The gates used are similar to those used in this country, except that a wire screen, or fence, is usually suspended from the lower side of the arm to prevent people from passing underneath. Carefully formulated directions to the public are issued; and it is rare that they are disobeyed.



## Maintenance of Way Section.

THE contest on "The Proper Handling of Work Trains" is creating considerable interest in this important subject among both maintenance and operating men, and a number of excellent papers have already been received. The problem of when a work train is advisable, the proper organization of forces to man, but not over-man it, and the selection of the proper conductor or foreman to take charge, are but a few of the points on which the efficiency or inefficiency of this method of handling work depends. This subject is one in which the operating as well as the maintenance department is concerned, and some of the best papers received so far are from operating officers. Men of each department can make valuable suggestions, from their particular standpoint, all of which will assist in the more economical conduct of the work. We desire to secure as thorough and representative a discussion of this subject as possible, and to that end urge that those who have had experience along this line, send in contributions dwelling especially upon those features in which there is the greatest opportunity for error or improvement. We will pay \$25 and \$15 for the two best papers received, and our regular space rates for all other papers accepted and published. All contributions must be received by the engineering editor, *Railway Age Gazette*, 608 South Dearborn street, Chicago, by December 27, in order to be considered by the judges of this contest.

IN many ways the year now closing has been one of decided contrasts in both the construction and maintenance of way departments. After a winter unusually favorable for operation, and not particularly hard on track, the outlook early in the spring was for an even busier season than existed during the previous year. The past few months have shown how far these prospects failed of realization. The first serious obstacle to these plans was created by the widespread floods throughout the central and southern states in March and April, the immediate effect of which was to divert practically all the funds intended primarily for betterment work to repairs and reconstruction on the roads within the affected areas. On the contrary many of the roads without this region proceeded with their extensive programs and bought much material. However, as business conditions gradually changed and the money market tightened during the summer, much projected work was postponed and some work already begun was discontinued. The result has been that during the latter part of the summer and fall there has been a slackening in the amount of work under way, although projects which have been started have been generally carried to completion. This relieved the labor situation to some extent. During the early months labor was as scarce as during the preceding year, but with the slackening of work this condition very largely disappeared. Increasing attention has been paid during the past year to means for securing greater efficiency from the labor employed. The Baltimore & Ohio has continued the development of its piece-work system in track work, and has added a bonus schedule. A departure of a different nature but directed towards the same end, was adopted by the Long Island on May 1, whereby track work is distributed through the entire 12 months rather than the summer season. There was also a marked tendency on the part of many roads to start work earlier in the spring, due partially to the fear of a labor shortage and also to a realization of the economy of work performed in this season as compared with that done in the hotter months.

ALTHOUGH a very general feeling exists among executive as well as operating and maintenance officers that section foremen are steadily deteriorating in quality and efficiency and that the primary reason for this condition is the fact that the wages of these men has remained almost stationary, while that of other employees has steadily risen, no definite measures are being taken to correct this situation. It is true that on a number

of roads increases of \$5, and in some instances of \$10 per month have been made, but while in the right direction, this is still insufficient to attract the proper class of men. A few roads have increased the wages of section foremen to \$75 or \$90 per month, but on the other hand, many roads have made no increase and are still paying about \$50. With the passing of the older men the problem is rapidly becoming one of wages alone, and with this situation the conditions are ripe for organization. In fact, it is quite generally known that the organizations of track employees are gaining strength, especially in the eastern states. Much as the roads decry the rise and increasing strength of organized labor, they are neglecting the means to ward it off in this department, and by their attitude of indifference are in reality aiding this movement most effectively. With the class of men now employed as laborers it is evident that most of the foremen of the future must be recruited from outside the ranks. Numerous plans have been suggested and are being tried to train men for these positions. Mr. Wollner's suggestion that promising boys in the general offices be trained for this work is not as radical as might first appear. It possesses the important advantages that the fitness of the boy for track work may be judged before he is selected, and that the best men may be retained in the employ of the company when they would otherwise probably go into other industries. To make such a plan as this a success it is necessary that the men not only have proper training, but that they have a position ahead of them with a sufficient salary to cause them to strive for it. It is to be hoped that these conditions will be met and that this plan will be given a fair trial on some road.

CONCRETE has been used to a limited extent for water tanks and reservoirs for more than 10 years, but the total number of such structures is still small and a large proportion of those built have been for municipal water supply and are of such large capacity that they can scarcely be put in the class with tanks required by railways. In view of the limited data available on which to base designs for such tanks, the tendency on a number of roads to adopt this type of construction at least experimentally is to be commended as showing the willingness of railway engineers to utilize the latest developments in engineering practice to effect economies in their work. The principal advantages of concrete tanks are their permanency and their low cost of maintenance. In some locations the possibility of making a concrete tank more pleasing in appearance than one of wood or steel may also be worth considering. The exact figures on relative cost and life are not yet available, on account of the small number of tanks in service and the short time that has elapsed since their construction. The tanks described elsewhere in this issue cost \$6,400 and \$7,200, respectively, for the same capacity, the difference being caused by a difference of 20 ft. in height above the ground. Wooden tanks are being built for less than half the above costs and those that are well built of the best select cypress or equally durable timber are showing a life as high as 30 years. Yellow pine tanks of the type commonly built probably do not have an average life of over 20 years, but at least one road is seriously considering the possibility of increasing this life of pine to about 30 years by creosoting the lumber for the tub as well as the frame. More care is being given to the selection of material for wooden tanks and to their construction than ever before with the result that much better service can be expected from this type of construction. While wooden tanks are not likely to be entirely eliminated for some time, concrete and especially steel tanks can undoubtedly show economies for many locations and conditions. The choice of a tank like any other structure, should be placed on the basis of capitalized cost and all the available data bearing on the first cost, maintenance and life of all

of the types of tanks should be used in securing a fair comparison.

THE vice-president of one road and the general manager of a parallel line made a joint inspection trip over their two roads a few weeks ago. On the way out on one road they passed a work train with eight men loading rail with a locomotive crane. On the return trip on the other line that afternoon they passed a work train with 20 men loading rail by hand. The comparison was so evident that on the following day the division engineer on the latter road received authority to buy a locomotive crane at once. This latter road does not differ widely from many others, in that while the advantages of the adoption of labor saving appliances of this nature have been realized in the abstract, such devices have not been applied locally to the existing problems. The development of labor saving equipment during the past few years has been rapid and the various appliances have met with quite ready adoption on the more progressive roads. As illustrated by the use of a locomotive crane with a special grapple for loading ties, described elsewhere in this issue, the variety of uses in which such equipment may be employed is limited in large measure only by the ingenuity of the user. Rail loaders, ditchers and motor cars are other examples of power driven labor saving appliances in common use. The variety of uses to which the engine of the motor car has been applied make a large series in themselves. The primary advantage of all these labor saving devices is, of course, the reduction in the amount of labor required, thereby reducing the cost of the work. Another advantage is in the greater speed at which material may be handled, which is especially important when working on the main tracks or in congested places. One eastern road frequently uses two locomotive cranes when loading or unloading rail on the main track to expedite the work. With the increasing number of foreigners unfamiliar with work of this nature and with our methods, these appliances also become an important factor in decreasing the number of injuries.

IN spite of the fact that in most departments of a railway the amount of "red tape" increases with the growth of the system, more discretion regarding the specification of material is gradually being left to the men who use it. A few years ago the general practice was to leave the selection of materials entirely to the purchasing agent, the specifying of certain makes or types being discouraged, and this practice still exists on many roads. The feeling is gaining ground, however, that the man who uses the material should have a voice in its selection, and he is being encouraged more and more to investigate the various makes of materials and to give the purchasing department the benefit of his experience in the form of recommendations or specifications accompanying his requisitions. He is thus not only inclined to take more interest in the service of a particular tool or material, but his suggestions are of assistance to the purchasing department, which in many cases is at a loss to determine the relative merits of different makes of material. This plan has been carried still further on several roads by giving the men in charge of important work authority to purchase material locally when the interests of the company can be best served in this way. It frequently happens that unforeseen conditions arise requiring certain material to be secured on short notice. If the work is held up until it can be secured through the regular channels the delay may be serious and expensive. On one road now doing a large amount of new construction, the men in charge have been encouraged to purchase as much material as possible locally when it could be secured at moderate prices, and this policy has been reflected later in very favorable traffic returns due to the friendly feeling created among local business men. With proper supervision and the exercise of good judgment, the preparation of specifications, and in many instances the actual purchase of materials by the men who use them, will prove economical, because it will help to secure the materials best suited to the work, reduce the

amount of reserve stock and insure greater care in the use of the materials.

A WESTERN road recently installed a rock crushing plant at a considerable outlay to prepare ballast for its use. A man unfamiliar with the operation of a rock crusher was transferred from another department and placed in charge. The cost of the crushed stone was soon found materially to exceed previous contract prices, the plant was turned over to the contractor, and the project was considered a failure. Another road installed a plant of the same type at another quarry for the same purpose. A man experienced in operating such a plant was hired at a salary of approximately \$2,000, and was placed in charge. This plant was a success from the start, and the cost of ballast has been materially reduced from the contract price previously paid. In another instance a road built a large dredge of the most improved design to construct embankments. A machinist from the local division shops, entirely inexperienced in the operation of a dredge, was placed in charge, although skilled dredge operators could have been secured if the road had been willing to pay a considerably higher monthly rate. The result was that, although the output of this dredge compared favorably with that of older and smaller dredges in the vicinity, it was several months before it was brought up to what it really ought to have been. If these two instances were unusual they would not be of sufficient importance to mention here. Unfortunately they typify what frequently happens in railway operation. Railway men pride themselves upon being specialists in their particular branches, but they frequently lose sight of the fact that experienced men are equally valuable and necessary in other work. In dealing with any problem not within the scope of every-day railroad operation, the economy resulting from the employment of men skilled in a particular line is too frequently underestimated. A plant of sufficient importance to justify a moderate expenditure for equipment should warrant the employment of an experienced man to operate it. Contractors realize this more fully than railroads, and the roads might well profit by the example set by them in this regard.

ON first thought one might expect to find that there would be more data available regarding the cost of construction work in the possession of railroads than of contractors or private engineers. Railways do not have the business motive that a contractor has for keeping such information secret in order to gain some advantage over a competitor; they have complete organizations for compiling it; and they maintain well organized corps of skilled construction engineers and superintendents who are accustomed to handling large work creditably. Also, in these days when charges of incompetence and inefficiency against railways are so prevalent, one would think that the publication of unit costs of work well and economically done would reflect to their credit. However, engineers interested in the collection of data regarding construction costs are aware that there is a very general disinclination among railway men to giving out such information. The importance to a man in charge of work of knowing the unit costs of his work has been emphasized repeatedly in these columns. There is an equal advantage in an exchange of cost data between men engaged on the same kind of work. Men in all branches of railway work meet in associations to discuss the best methods of doing things. Could they not exchange figures regarding the costs of the things done by these various methods to equal advantage? Not only is there general reticence on the part of the railways regarding this information, but on many roads it is not kept in such a way as to enable the engineer in charge to have any definite idea of unit costs. No exchange of data of any value can be made until such records are compiled. A contractor who carried on a large piece of construction with as little information regarding his actual unit costs as that available on the average railway would soon be forced into bankruptcy.



# SCHUYLKILL RIVER BRIDGE IMPROVEMENTS.

Widening a Masonry Arch Structure on Pennsylvania Main Line in Philadelphia to Carry a Five-Track Passenger Line.

The main line passenger trains of the Pennsylvania between New York and Philadelphia and also the Atlantic City and other seashore passenger trains use a double track line between North Philadelphia and West Philadelphia. The requirements of this very dense passenger traffic have made necessary an increase in the capacity of this line and work is now under way which will provide four tracks over the entire section and five tracks in some places. The most important feature of this improve-

ment work is the widening of the Schuylkill river bridge and the structures over adjacent streets. The old bridge over the river, which was built about 1866, consisted of seven 60-ft. masonry arches and one 250-ft. deck truss span. This old structure was found to be in very good condition and, with some minor repairs, the masonry will be good for many more years of service. The old piers and arches



General View of Old Bridge.

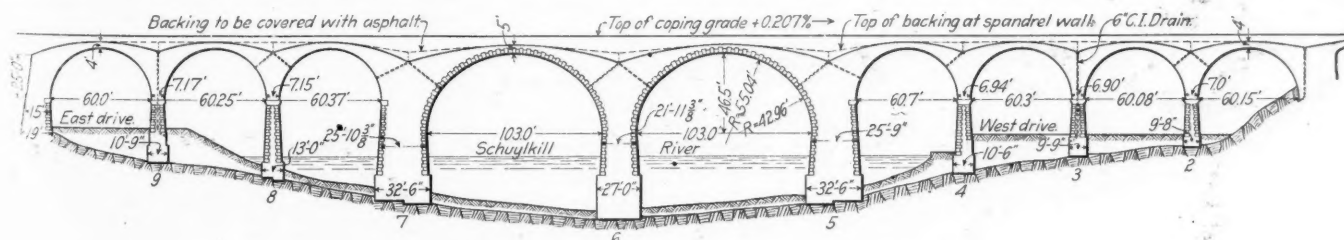
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## THE OLD AND NEW BRIDGES.

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placed, for a clear space of 13 ft. is left between the old truss and the two new channel spans. After the completion of the new portion of the bridge, traffic was turned over the two new tracks, and work is now under way on the necessary repairs to the old bridge.

In addition to the river bridge the work includes two 45-ft. arches adjoining the west end of the bridge spanning Lansdowne drive, the boulevard entrance to Fairmount Park, a steel and



Longitudinal Section of Schuylkill River Bridge.

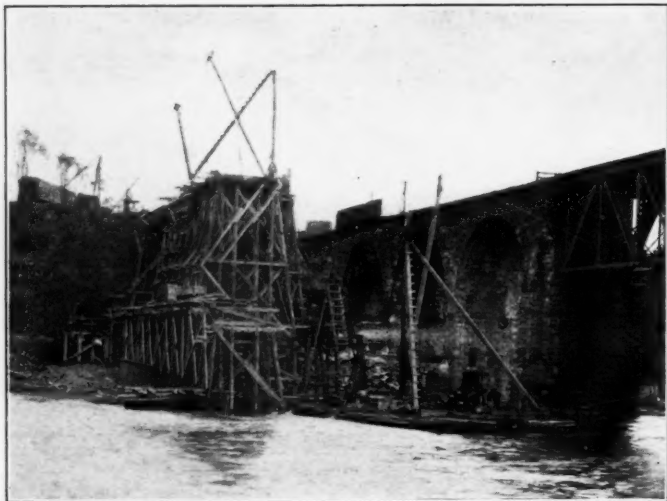
are being extended up-stream to carry the additional tracks, the new work being made to conform in appearance with the old bridge so that when finished it will form a single structure. In order to eliminate the steel span over the channel a center pier is provided which divides this span into two 103-ft. arches for the new structure. As the old truss still has about eight years of life it has not yet been decided whether it will be re-

placed, for a clear space of 13 ft. is left between the old truss and the two new channel spans. After the completion of the new portion of the bridge, traffic was turned over the two new tracks, and work is now under way on the necessary repairs to the old bridge.

## BUILDING THE NEW PIERS AND ARCHES.

The new river piers are all of concrete with ashlar stone facing. This facing is laid in the ordinary manner with two

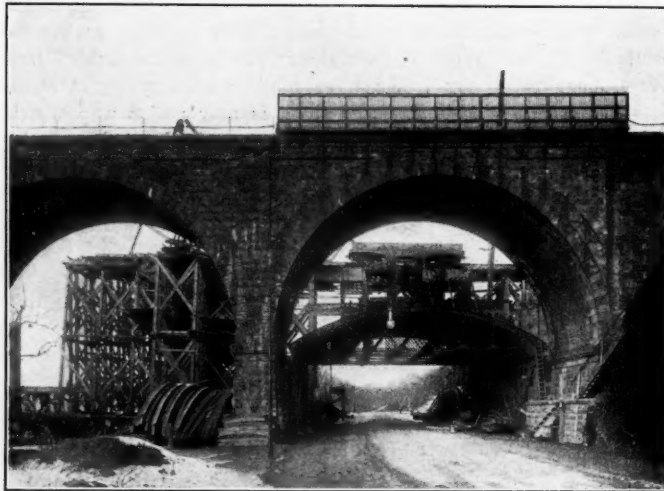
courses of stretchers and one of headers. The new pier in the center of the river is 27 ft. wide and 90 ft. long over the footings, sufficient for a five-track bridge, the other piers having the same width as the old. The east abutment is 66 ft. 6 in. long and is built of concrete with ashlar facing. No west abutment is required as the end arch of the river bridge adjoins the first concrete arch of the Lansdowne drive bridge. The maximum depth to rock under the river is about 38 ft. below water level. This rock is overlaid by about 5 ft. of mud. The old river piers had not been carried down to rock, crib work being used either partially or entirely to support them. While this old



High Trestle for Bringing in Material.

crib work was apparently in excellent condition and no evidence of underscour could be found it was decided to place a concrete casing around the timber cribbing as an additional precaution. The two piers supporting the old truss span, which also served as abutments for the adjacent arches, had been strengthened

since their construction by the addition of a facing of ashlar masonry on the side opposite the arches as a precaution against damage from the thrust of these arches. This reinforcing masonry was carried down to rock alongside the crib work on which the original piers had been placed. In the present im-



Two of the Old Arches at East End, Showing Material Track and Forms in Place for New Concrete Arches.

provement the old crib work has been encased in concrete, which is carried up a foot or two above the bottom of the old piers.

The work on the shallow piers on both shores was carried on in cofferdams of Lackawanna steel sheet piling which were pumped out to allow all concrete to be placed in the dry. Very light wooden cofferdams were used for the deep piers and no attempt was made to pump them out until the concrete footings had been completed up to an elevation 6 ft. below the surface of the water. The ashlar facing and the concrete backing above this level were placed in the dry. For placing the concrete

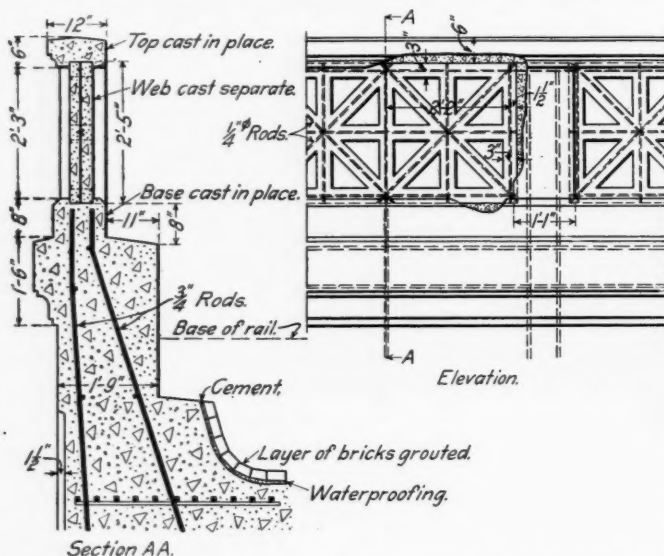


Low Level Trestle Across River from Which Concrete and Stone Were Placed.





above the springing line of the arches was built with its end adjacent to the high level trestle so that material received on the siding could be brought out on the high trestle, lowered to the low trestle and carried out to any portion of the work. The concrete mixing plant was located at an elevation between that of the high and low trestles so that cement and sandstone could be handled to the mixer and the concrete from the mixer by gravity. A cement house and facilities for storing sand and gravel were provided along the siding. The concrete plant included three mixers, two of which were of 1-yd. capacity. The best day's run with these mixers was about 450 yds. The concrete used for backing was a 1:3:5 mix and that in the arch rings 1:2:4. The concrete was handled from the mixing plant to the piers in 1-yd. buckets carried on narrow gage cars which were pulled along the trestle by a dinky engine. Five steel-boom derricks located at uniform intervals along this trestle handled these buckets from the cars to the piers. These derricks were supported on clusters of long piles driven into the mud on the



Details of Ornamental Concrete Railing on Lansdowne Drive Bridge.

river bottom. Steel centers were used for supporting the arch rings, these centers being carried on framed bents resting on offsets provided on the sides of the piers.

#### LANSDOWNE DRIVE AND GIRARD AVENUE BRIDGES.

The new structure over Lansdowne drive consists of two five-centered 45-ft. arches which replace five 21-ft. segmental arches. Although the very flat arch which was adopted for this structure is perhaps not as pleasing as the segmental type for a structure in which esthetic design is important, this type was made necessary by a lack of head room. The railway grade over the arch was, of course, fixed and that fact combined with the clearance necessary for the automobile traffic under the arch very closely limited the choice of a curve for the intrados. These arch rings are very heavily reinforced and are covered by a fill of one and two-man stones up to an elevation 2 ft. below the base of rail. On this fill the regular stone ballast is laid. The faces of the arches, the end of the center pier and the two pilasters are paneled, and all of the concrete in the face of the structure is bush hammered with the exception of 1-in. strips along the corners, which serve to outline the structure very effectively. Panels of 6 in. by 6 in. green Grueby tile are set in the concrete at the tops of the pilasters. The surface of the west abutment is broken by horizontal scoring which harmonizes well with the details of the rest of the structure. The coping along the abutment and over the arches is surmounted by an ornamental concrete railing, shown in the accompanying photograph, which is cast in short sections in a yard especially fitted

for this class of work, the units being held by the upper and lower rails, which are moulded in place.

The Girard avenue structure, which crosses an important street at a skew of 32 deg. 43 min., is of steel construction, having longitudinal girders supported on center and curb columns. A solid concrete floor is laid on transverse I-beams, and the columns and girders are encased in concrete. The ornamentation of the bridge conforms to that used on the Lansdowne drive arches, including the scoring on the abutments, panels on the faces of the girders, green tile on the abutment pilasters and the ornamental concrete railing.

The waterproofing on the Girard avenue and Lansdowne drive bridges is five ply Hydrex covered by bricks which are grouted in cement. Fibre conduits are carried across these structures to encase telephone, telegraph and signal wires. Provision has also been made in separate conduits for power wires which would be required in the event of possible electrification of this line. These conduits are supported across the space over the haunches of the arches on old rails laid on the crown of the arch.

The crossing of the Philadelphia & Reading tracks east of



Steel Encased Bridge Over Girard Ave.

the river is made on a concrete arch which is of standard construction and has no unusual features.

The addition to this bridge was begun in July, 1912, and work has been prosecuted continuously since that time. Traffic was turned over the two new tracks on November 2. This work was handled under the direction of A. C. Shand, chief engineer; E. B. Temple, assistant chief engineer, and W. L. Zeigler, engineer of construction. Eyre Shoemaker, of Philadelphia, is the contractor for all work adjacent to the river crossing.

## RESPONSIBILITY FOR MINOR DERAILMENTS

By E. R. MEREDITH,

Supervisor, Philadelphia & Reading, Coatesville, Pa.

One of the most vexing phases of railway operation is caused by the small derailments in yards and on the line where one or two cars or even pairs of wheels get off the track. The actual money value of the repairs to track and equipment is usually small. These derailments are accepted as necessary evils, and no account is taken of their wider-reaching effects in delays to train movement and to the complete upsetting of a well-planned day's work by yardmasters and despatchers. The investigations are usually more or less perfunctory and are often merely attempts of the various departments to saddle the blame on each other and to clear their own skirts. It is even considered a clever bit of work when the roadway, the transportation or the inspection department can unload the blame from its own shoulders to its neighbor's.

The writer believes that this is wrong. It has been his experience that such a course leads to carelessness on the part of all concerned, to personal friction between the heads of departments, and especially between their subordinates, and to a gen-



eral attitude which prevents harmony of effort among the various employees, a harmony whose value cannot be measured in exact dollars and cents, but which, nevertheless, is one of the most necessary and valuable assets in economic operation. With this end in view, absolute fairness and frankness in the investigation of these small accidents, and willingness to accept responsibility for them are required. It goes against the grain, of course, to admit that one's own department is partly at fault in such matters, but this personal humiliation should not outweigh the certain benefits of an honest understanding of all the causes of the trouble.

Nearly all these accidents are due to a combination of causes but it is the custom to select the most glaring of these and to disregard the others. Each department head, of course, sees most clearly the errors of omission and commission of his neighbors, and, voluntarily or involuntarily, shuts his eyes to the shortcomings of his own men. This tempts all concerned to conceal their own liability and to feel that when they have done so they have done a creditable thing, a feeling which, unfortunately, is sometimes connived at and even encouraged by the very men to whom the management looks for an unbiased administration of the divisional departments.

The department of railroad work with which the writer has always been associated is the roadway. Numerous investigations of derailments on the line and in yards have convinced him that in nearly every case the track is in part responsible. This statement will no doubt be challenged by the great majority of maintenance of way officers, but he repeats that a fair and honest investigation will convince an unbiased authority that for these minor derailments the roadway department must almost always take a share of the blame. It is not meant that they are entirely or even primarily responsible, but that they are in a measure at fault. It is not sufficient to say that because the load shifted, the trucks were defective, the flanges sharp or the car did not slew the roadway is absolved, but it must first be proven that the same accident would have occurred under perfect conditions of line, surface, elevation, etc. To say that a piece of track is put up well enough for cars in average condition to operate safely does not free us from responsibility when a car below the average is derailed, provided that if the track had been a little better, the accident would not have occurred. A switch may be sufficiently well adjusted to permit a thousand ordinary cars to pass over it with perfect safety, but if one of the thousand with a flange sharper than it should be picks the point, open slightly, the sharpened flange should not be credited with all the blame. Some of it belongs to the roadway department. Instances could be multiplied indefinitely of these minor accidents resulting not from one specific cause, but from a number of causes, each insufficient in itself to make the trouble.

If this is true of the roadway department it is equally true of the others. Derailments primarily due to track defects are assisted by defective equipment, improper loading and careless handling. Closer inspection of cars and lading would go far towards reducing the number of these accidents. Rigid discipline and close supervision of crews to avoid careless handling and fast running would do as much more.

In these days of lowering income and increasing expenses it is not merely true that the penny saved is the penny earned. It may even be the only penny on the right side of the big ledger. In the prevention of these minor accidents there is a large field for saving. Department heads can do no work better worth while than to investigate their causes frankly and fairly. With the results thus obtained they will be in a position to get after the causes and so to improve their departments that a large number of these vexatious and indirectly costly accidents may be averted. There is no use trying to load it all on the other fellow, if part of the blame belongs to you. By so doing you are inviting a second accident just like the first, you are encouraging your men in careless habits, irritating your co-workers, and, worst of all, you are wasting your employer's money in preventable accidents.

The proper thing is for all concerned to get together, ascertain all the real causes, not merely the main one, and then each man should get after his subordinates with a sharp stick to remedy the weak spots in their work uncovered by the investigation.

When one's own department has been brought up to such a state of perfection that no accidents can be attributed to it even in part, he is in a position to hold up his neighbor to ridicule, but not till then. The old saying concerning beams, motes, brothers and eyes is as true of twentieth-century railroad operation as it was of the rural life in Palestine two thousand years ago.

### CONVENTION OF THE WOOD PRESERVERS' ASSOCIATION.

The tenth annual convention of the American Wood Preservers' Association will be held at the St. Charles hotel, New Orleans, La., January 20-21-22, 1914. Papers will be presented on "Treatment of Piling and Timber According to Conditions of Use and Exposure," by E. L. Powell, vice-president, American Creosote Works; "The Effect of Varying the Preliminary Air Pressure in Treating Ties Upon the Absorption and Penetration of Creosote," by Clyde H. Teesdale, Forest Products Laboratory; "Mechanical Handling of Railroad Cross Ties and Timbers at Timber Preservation Plants," by Lambert T. Ericson, assistant superintendent, Port Reading Creosoting Plant; "Methods of Keeping Tie Records," by E. T. Howson, engineering editor, *Railway Age Gazette*; "Air Pumps Versus Pressure Pumps for Injecting Preservatives Into Wood," by F. J. Angier, superintendent timber preservation, Baltimore & Ohio; "Future Tie Material in the United States," by H. H. Gibson, editor, *Hardwood Record*; "The Protection of Ties from Mechanical Destruction," by Howard F. Weiss, director, Forest Products Laboratory; "Preliminary Work in Fireproofing Wood," by Robert E. Prince, Forest Products Laboratory; "The Yale Forest School," by Samuel J. Record, assistant professor of forest products, Yale University; "Some Methods of Separating Water from Creosote Oil," by Thomas White, assistant manager of American Creosote Works; "A Comparison of Wood Paving in European Countries and the United States," by S. R. Church, manager, research department, Barrett Manufacturing Company; "New Type of Paving Block Plant," by J. B. Card, manager, Chicago Creosoting Company; "The Construction of Creosoted Wood Block Pavements," by R. S. Manley, president, Creosoted Wood Block the slopes varying from two in. per ft. to four in. per ft. Paving Company; "Results Obtained by Piling Creosoted Wood Blocks Closely in Cages and the Saving Effected Thereby," by R. H. White, president, Southern Wood Preserving Company.

In addition to these individual papers, reports will be presented from standing committees on "Preservatives," "Preservation of and Specifications for Timber, Ties and Piling," "Wood Block Paving," "Plant Operation" and "Miscellaneous Subjects."

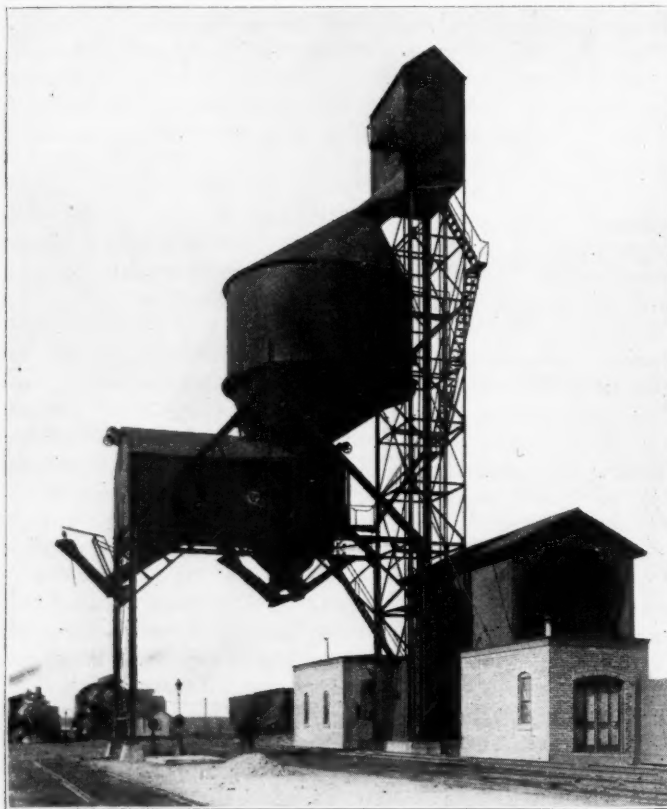
On Wednesday a trip will be made to the plant of the Great Southern Lumber Company at Bogalusa, La., said to be the largest saw mill in the world. An hour's stop will also be made at the plant of the Southern Creosoting Company at Slidell, La.

**SLOPE OF CONCRETE CHUTES.**—Considerable experience was gained in chuting concrete to place in building the numerous concrete structures in connection with the elimination of grade crossings on the New York, Chicago & St. Louis in Cleveland. According to the statement of A. J. Himes, engineer of grade elimination, in Bulletin No. 160 of the American Railway Engineering Association, wooden chutes were made two ft. wide and 8 to 10 in. deep. With planed boards, the preferable slope is four in. per ft. Slopes of two in. per ft. require a man to keep the chutes clear and of six in. per ft. cause the ingredients to separate and require the use of baffles to retard the motion. Iron chutes were made 20 in. wide and 8 in. deep, depending upon the amount of water in the concrete.

## NEW COALING STATIONS ON THE OREGON SHORT LINE.

A new coaling station which includes a combination of power operated coal breaker with a balanced bucket elevating system, scale pockets and scales and complete sand handling equipment has just been completed at Minidoka, Idaho, on the main line of the Oregon Short Line. The details of this design were worked out by the engineering department of the Oregon Short Line under the direction of Carl Stradley, chief engineer, in connection with the T. W. Snow Construction Company, Chicago. This plant is of the balanced bucket type and is of steel construction throughout with the exception of the power house and sand drying house, which are of brick.

Briefly, this coaling station includes a power operated coal breaker or crusher for sizing the coal instead of the usual breaker bars, with a hopper below the level of the track of sufficient capacity to hold a carload of coal. By this means, the customary trouble with the choking of the coal in leaving the cars is eliminated as the coal has a clear drop into the



New Coaling Station and Sand Handling Plant at Minidoka, Idaho.

hopper. Two  $1\frac{1}{2}$ -ton buckets fed by automatic cylindrical loaders, elevate the coal into the overhead bin from which it is dropped by gravity into two 8-ton scale pockets each equipped with a hopper scale with registering beam, which punches the weight of coal on a printed card. From the two 8-ton pockets the coal is delivered to three tracks as shown, by means of side swaying spouts covered at the lower end to prevent spilling coal over the side of a locomotive tender.

In addition to the coaling station, a dry sand house and a wet sand bin are provided. The former is equipped with a "Viloco" automatic sand dryer and an improved sand screen. The dry sand drops by gravity into a pneumatic sand tank and is then elevated by means of compressed air into the small cylindrical tank shown over the tracks in the photograph.

This plant has a capacity of 60 tons of coal per hour and

over 10 cu. yds. of dry sand per day of 10 hours. The entire plant, including the coal breaker, is operated by a 40 h. p. Otto gasoline engine adapted to use distillate as fuel. The engine is started on compressed air furnished by the compressor of the sand handling equipment.

When drop bottom self-clearing coal cars are used to minimize the amount of shoveling required, this plant will handle between 300 and 400 tons of coal per day with a force consisting of one engineer and two helpers and this capacity can be doubled if necessary. The storage bin holds 200 tons, the plant being designed for economical handling of coal rather than for large storage capacity.

As a result of the successful operation of this plant at Minidoka, a similar one is now being built on the same road at Kemmerer, Wyo. Another coaling station of the same general design but for two track service, has been erected at Bancroft, Idaho, on the Oregon Short Line. This station has a capacity of 40 tons per hour with a 150-ton storage bin and is equipped with breaker bars instead of the power operated crusher for sizing the coal. Two other Snow steel coaling stations have also been built recently on the Oregon Short Line at Twin Falls and Jerome, Idaho.

## BRIDGE INSPECTION ON THE B. R. & P.

The Buffalo, Rochester & Pittsburgh engineering department, of which E. F. Robinson is chief engineer, has recently prepared a "Blue Book" on inspection, which covers in a brief but comprehensive manner every inspection required in the maintenance of tracks, structures, water stations, signals and scales. The instructions referring to bridge inspection are of particular interest in connection with the discussion of this subject which was published in the *Railway Age Gazette* of November 21.

On the B. R. & P. trackwalkers must inspect all bridges and culverts daily, reporting their condition to the section foremen. The section foremen must make a general inspection of everything on their sections once each week, including bridges and culverts, particular attention being given to abutments, piers, pedestals, bearings, piles, bents, stringers and caps. The foremen report to the roadmasters on matters requiring attention which they are unable to correct, a special weekly report being made to cover all pipes, culverts and bridges. If everything is in good condition one report can be made giving a list of the structure numbers, but if any structure requires work a separate report must be made for that structure.

Division inspectors make a detailed and careful inspection of bridges and culverts each month, reporting the result of such inspections to the supervisor of bridges and buildings. Separate reports are made for each structure and copies are sent to the division engineers. This inspection is made "out of face" on foot or speeder. As a bi-monthly inspection of all structures not covered by the monthly inspection is required, a man from the regular force accompanies the division inspector on this bi-monthly trip in order to cover bridges and buildings on the same trip over the line. Roadmasters and supervisors of bridges and buildings make special inspections of their entire divisions every three months. The two men travel together on foot, hand car, or motor car, and the reports are made to the division engineers, giving dates, conditions and recommendations in detail. The division engineers, signal engineer, master mason and supervisor of water service, accompanied by the supervisor of bridges and buildings, roadmasters and supervisors of signals, inspect the entire property during the months of April and May and again during the months of October and November. This inspection is made "out of face" on hand car or motor car, and a full report is made to the chief engineer. The general inspector inspects and reports to the chief engineer on the condition of the entire property once each year. This report shows the condition of each mile separately.



# MAINTENANCE OF WAY MASTER PAINTERS' ASSOCIATION.

## Second Half of Report of Recent Convention at Louisville with Abstracts of Several Papers Presented for Discussion.

In the closing business session of the tenth annual convention of the Maintenance of Way Master Painters' Association, held at Louisville on Thursday, November 20, the following officers were elected for the coming year: President, C. H. Plummer, C. R. I. & P., Topeka, Kan.; first vice-president, F. C. Rieboldt, C. M. & St. P., Milwaukee, Wis.; second vice-president, E. R. Cope, Pennsylvania Lines West, Pittsburgh, Pa.; secretary-treasurer, T. I. Goodwin, C. R. I. & P., Eldon, Mo. The next convention will be held at Detroit, Mich., November 17-18-19, 1914.

In addition to the papers published in the *Railway Age Gazette* of November 21, page 982, the following were presented:

### TESTS OF BRIDGE PAINT.

A paper by J. S. Rice (L. S. & M. S.), discussed the results of a test of a number of bridge paints first exposed in March, 1907. A partial report of this test was made at the convention three years ago, but as it has now been more than six years since the beginning of the test, some definite information can be obtained as to the relative value of the paints.

All of the pieces of metal are showing some rust around the holes which were used in nailing the pieces to the wooden supports. The first three samples are composed of red lead straight, using different proportions of lead to the gallon of oil. The next three have the same proportions of lead with lamp black added. The next sample has red lead straight, for first coat, red lead and lamp black for second coat, and straight lamp black for the third coat. The eighth has only ten pounds of red lead and one pound of lamp black for the first and second coats, and plain lamp black for the finishing coat. This is the old Lake Shore formula for painting bridges. No. 9 has 33 lbs. of red lead to the gallon of oil, and instead of using all linseed, one-quarter of the vehicle is benzine. All of these samples are in good condition. They were made of pure materials, and are showing the superiority of pure red lead as a pigment for paint to be used on structural steel.

No. 10 has three coats of Eddy's lamp black, and No. 11 three coats of Germantown make mixed with oil by hand. These are showing signs of rust; the latter, however, more than the former, due apparently to a difference in quality, one costing 20 cts., and the other 13 cts. per lb.

In No. 12, the order of painting was reversed, lamp black being used for the first coat, red lead and lamp black for the second coat, and straight red lead for finishing. This sample is a complete failure and shows the fallacy of using a thin, soft paint at the bottom and a heavy, hard paint at the top as some people have recommended. No. 7, with the painting done in the reverse order is wearing well. A complete knowledge of the composition of a paint, will often prevent such mistakes.

Nos. 13 and 14 are graphites which are said to contain under 50 per cent. of pure carbon, and they are showing signs of rust—one more than the other. Nos. 15 and 16 are carbon paints and are commencing to rust. No. 17 is supposed to contain Portland cement and white lead, in the pigment. This sample is badly rusted. No. 18 is a combination paint of red lead and carbon which is sold by the manufacturer in ready mixed form. It is standing in good shape.

No. 19 is similar in composition, but has white inert material added. It is not doing so well. Nos. 20 and 22 are carbon paints possessing different amounts of carbon. Both are beginning to show rust. No. 21, was omitted from the numbering.

Nos. 23, 27, 28, 30, 31, 32 and 38 are samples on which different kinds of pigment were used for each coat. The first coat was a heavy paint, the finishing coat being lighter and softer with the second coat of medium weight. All these paints are doing well at present. No. 35, which is of similar construction is the only one which shows any rust spots. No. 24

is a dark olive green paint supposed to have a white lead base. It is wearing well. No. 25 has red lead and lamp black and white inert pigment and at the present time is all right.

No. 26, which consists of red lead and graphite in equal quantities, is beginning to rust. No. 29, a mixture of red lead and iron oxide is doing well. No. 33 is a ready mixed red lead paint, about 65 per cent. pure. It is rusting badly. No. 34 is a high-grade asphaltum paint—the metal is rusting very badly.

No. 37 is a high grade iron oxide paint. It has done well for a paint of this kind, but is beginning to show signs of rusting. No. 39 is another iron oxide paint having a much larger percentage of iron. This is still intact. No. 40 is a lead and zinc paint of grey color, and is supposed to have a small proportion of white inert material in combination. It is rusting badly. No. 41 is a ready mixed red lead with much less proportion of red lead than No. 33. It is in worse shape than 33.

No. 42 is a graphite paint having over 75 per cent. of carbon. It does not show rust. No. 43 is a blue lead paint, with white inert added. It is rusting and not doing as well as if it had been made of the pure material. No. 44 is a carbon paint of good quality, and at present is doing well. No. 45 is made from one of the Utah asphaltums or hydrocarbons and like other paints of its kind is now scaling badly. No. 46 was said to have graphite and lamp black combined. It is rusting. No. 47 is a manufactured graphite of high purity. It commenced to show rust spots in 1910.

No. 48 is another ready mixed red lead paint and was said to have some iron oxide combined with the lead. It is rusting. There is no No. 49. No. 50 was made of a coal tar product which has been hard pushed by its manufacturer and has no linseed oil in it. It began to fail early in the test and is now completely rusted.

At the present time it is safe to draw the following conclusions: First, that paints made of linseed oil, are the only ones which can be depended upon for good wear on bridges, and structural steel; second, that it is better practice to use paints of different composition and colors for each coat, whether on new work or the repainting of old structures; third, that red lead paints made pure will wear longer than when adulterated with white inert pigments; fourth, that the heaviest paint should always be at the bottom as a foundation coat; fifth, that paints made of coal tar and asphaltum should not be applied next to the iron if best results in wear are desired.

### TEST OF SIX BRIDGE PAINTS.

A. B. Phelps (L. S. & M. S.) reported that he applied six brands of black paint on a bridge at Vermillion, Ohio, on the main line of the Lake Shore & Michigan Southern in July, 1911. The bridge carries three traffic tracks and has three spans, one riveted plate girder being used under each rail, making six girders for each span and eighteen in all. Each of these girders is 10 ft. deep and 90 ft. long. They received a shop coat before leaving the bridge plant which was supposed to consist of red lead and lamp black in proportion of 1 to 10. They were stored from four to six months before erection. After being placed in position there was applied to the six girders in the east span, two coats of the following paints, one kind on each girder: Mancolite, Steel Preservative, Lino Metal Paint, Nev-a-rust, U. S. N. Armor Black, and Nobrac.

The middle six girders were treated in the same manner except the order of the paints was shifted so as to make the test as fair as possible. The six girders in the west span were given one field coat of a ready mixed red lead, called "Ferric" red lead, over which was applied one coat of each of the above mentioned six black paints, again shifting the order. On October 31, 1913, after 27 months of exposure, an inspection was

made which showed that all of the girders in the west span which had received one field coat of ready mixed red lead before the application of the black, were in better condition than any of the twelve which had been given two coats of the black paints and no field coat of red lead.

All of the paints are still intact with the exception that in a number of cases the top flanges show the effects of corrosion from brine drippings. In one girder the rivet heads in the lower flange are rusting slightly and in two cases the color on the outside girders is fading somewhat.

#### WORKMEN'S COMPENSATION LEGISLATION.

The following paper was presented by Edward H. Brown, editor of the *Painters' Magazine*.

Workmen's compensation laws are already in force in 17 states and federal legislation of this character is being actively urged and will probably be passed at the next session of congress. Similar laws have been enacted or are under consideration in all the provinces of the Dominion of Canada.

Briefly, the effect of these laws is to deprive the employer in suits brought by workers to recover damages for injuries sustained in connection with their occupation of the three common law defenses which have been used; first, the assumption of risk in accepting employment; second, the negligence or fault of a fellow servant, and third, contributory negligence on the part of the injured employee.

Most of the American workmen's compensation laws have been modeled after those in force in England, although so far none of them have included occupational diseases. In Ohio, the law provides for an insurance fund managed by the state, this insurance being compulsory with all employers, except corporations of certain financial responsibility, such as railway companies, which may maintain approved benefit funds or mutual insurance associations with the provision that they must contribute to the reserve of the state fund. In the state of Washington, workmen's compensation insurance is managed by the state and all employers are compelled to insure through this fund. In some states such laws apply only to certain occupations classed as dangerous or hazardous. In the State of New Jersey, however, the law applies to all classes of labor and to all employers, except in the case of temporary employment.

Thoughtful people almost universally agree that workmen's compensation is more equitable than the old common law theory which made the employee bear the entire burden of injuries or disease resulting from his occupation. The advocates of such legislation urge that it need not bear heavily upon employers because they may protect themselves by insurance, raising the prices of their products to meet the cost of such insurance. This may be true of manufacturers but it does not apply to railways. The Interstate Commerce Commission and public service commissions in the various states very effectively prevent the roads from increasing their revenue and the stockholders naturally look on workmen's compensation laws as one more straw added to the burden that is gradually breaking the camel's back. If no relief is granted, the return on railway investments will undoubtedly be reduced to a minus quantity.

Various workmen's compensation laws that have been enacted however, are only the opening wedge. If it is just that the industry should bear the burden of its accidents, why should this principle not apply equally to occupational diseases.

In many occupations, including painting, diseases are caused by poisonous materials used, by dust that is inhaled, or by working in close, ill-ventilated quarters. In England, the industries must now bear the burden of such diseases and trade unions of this country are beginning to advocate similar laws here.

As master painters you are not financially responsible for this burden but in safeguarding the interests of the companies which employ you it is your duty to look out for the safety of your men, so far as possible, and to recommend to your superior officers the adoption of any devices that may prevent or reduce accidents and disease to a minimum.

There are many dangers to which roadway, bridge and building painters are exposed, and which master painters must caution them against. When painting switch targets and signals, special care must be taken to avoid being run down by trains when moving from place to place on a hand car or speeder. Men painting bridges must always use special caution and it would seem prudent to require a new man to pass a physical examination to see that he is free from stomach, kidney and nervous trouble of all kinds before putting him on bridge painting, especially over running water. Under workmen's compensation laws the railway may be compelled to pay a man a pension for months or even years for an accident caused by his own weakness if this weakness is not detected before he is employed. Men should be very carefully instructed in the proper handling of gasoline torches for burning off old paint, and unusual measures should be taken to avoid the dangers due to carrying and working with highly inflammable and explosive materials. The men should not only be forbidden to smoke in, or carry a light into a car containing turpentine, benzene, naphtha, or varnish, but it should be impressed upon them that disobedience to this rule will be sufficient cause for dismissal. The only kind of portable light that can be employed in a car containing volatile inflammable materials is an electric flash-light.

In probably no other line of industry are more dangerously poisonous materials used than in the painting trade. Among the pigments are white and red lead and chrome yellow. Among the liquids are turpentine, benzene, benzole, carbolic acid, carbon di-sulphide, etc. Another danger to which the painter is exposed is the dry sand papering of lead paint, or the chipping off of old red lead. The practice of eating with unwashed hands or without changing the clothes while at work may result in introducing lead into the system, and causing 'lead poisoning'. Dizziness, which may cause a man to fall and receive serious injury, is frequently caused by inhaling the fumes of turpentine or benzene.

The department of labor has been studying the question of occupational diseases and those incidental to the painters' trade have been made the subject of Bulletin No. 120, recently issued by the Bureau of Labor Statistics. In the summary, Dr. Hamilton says:

"This study of the painters' trade in the United States shows that there are many elements of danger, most of them avoidable, and it shows that if protective legislation is to be passed it should be directed toward the prevention of poisonous fumes and dust, and the provision of facilities for bodily cleanliness.

"Such legislation should forbid, first, the use in unventilated rooms of paints or paint removers containing volatile poisons; second, forbid dry sandpapering or dry chipping off of lead paint; third, insist that the employer provide a proper place for his workmen to hang their street clothes and keep and eat their lunch, and a washroom with a sufficient number of basins, warm water, soap, towels and brushes; fourth, require the labeling of all paint offered for sale in such a way that the painter can be apprised of the danger involved in its use; and fifth, in the case of work done in factories, cards of instruction for the workmen should be posted, and if necessary these should be written in one or more foreign languages."

It seems that the facts brought out in this report could well be brought to the attention of the safety departments of the railways. The bulletin shows that by using proper precautions, the dangers from poisoning from materials used in painting can be minimized almost to the point of elimination, but that without such precautions a much larger proportion of painters show symptoms of occupational disease than is usually recognized.

#### DISCUSSION.

The discussion following Mr. Brown's paper covered various subjects referring to the safety of men employed in painting large structures and the precautions that should be taken by foremen, particularly in view of the liabilities imposed by the new workmen's compensation laws. It was repeatedly emphasized that foremen must personally inspect ropes, planks and other



rigging used by the men on high structures where the danger is great. One member suggested that he had found it well to use rope as large as 1 or 1 1/4 in. to support the staging on bridges over 100 ft. high as with the large rope there is less danger of its being worn through when it passes over sharp edges or of its being cut by coal or other material falling from the deck of the bridge. A number of other members, however, differed from this opinion on account of the fact that large rope is unwieldy to handle, thereby increasing the danger to the men. Several expressed the preference for 1/2-in. rope and these members agreed that 3/4-in. rope was probably the largest that should be used. The practice of cutting a rope immediately when it is noticed that one strand is broken, was generally approved in order to prevent any chance of its being used in an unsafe condition.

#### SAFETY IN THE STORAGE OF OILS AND PAINTS.

The following abstract is from a paper read at a meeting of the Safety Committee of the Atchison, Topeka & Santa Fe, by J. W. Gibbons, foreman locomotive painter, and presented to the Master Painters' Association, by Mr. Brown:

I have divided the subject into three parts, mineral oils, saponifiable oils and paints and varnishes.

Mineral oils are all a product of crude oil, including gasoline oil, benzine, coal oils and high grade kerosene oils, among which are headlight oil, mineral seal, paraffine oil, lubricating oils, etc. There is little if any danger of spontaneous combustion from mineral oils, unless subjected to a very high friction. But a large percentage of these oils are explosive, and in handling them care should be taken never to expose them to an open flame or spark of fire. And, as the volatile oils constantly throw off gas, all vessels used in transporting them should be absolutely air tight, as a small vessel containing this class of oil in a warm room would in a few minutes throw off enough gas to cause an explosion upon the striking of a match, or entering the room with a lighted pipe or cigar. This is why the "no smoking" rule should be strictly enforced in all buildings or cars used in the storing or transportation of oils.

Special care should be taken when putting oil into containers to allow for the expansion of the oil, for in hot weather, or if in close proximity to fire, or in a hot room, the expanding gas arising from the oil might cause an explosion.

In using volatile oil for cleaning or similar purposes it should be drawn off into a bucket equipped with a lid, fastened on by a hinge, and when not in use the lid should be closed tight.

When a vessel containing gasoline or other oils becomes ignited, do not try to carry the vessel out of the building. More people are injured and small fires made large conflagrations by people spilling the oil over the building than by the explosion of the oils. Remember, all danger of explosion is over after the first flash. This flash is caused by the accumulated gas becoming ignited and after this accumulated gas is consumed the fire will burn evenly, and if the flame does not endanger the surrounding property no harm would result other than the loss of the oil, and possibly the container if you would let the fire burn itself out.

All that is necessary to put out a fire of this kind is to cover the opening in the vessel with a piece of sheet iron or wood, or smother it by holding a heavy cloth over it closely. The fire extinguishers, which are found in every part of the shop and office buildings, are also very effective in extinguishing flames of this nature.

Under the classification of saponifiable oils, we have the various kinds of vegetable oils and those oils obtained from animal fats. These oils are not explosive unless heated to a very high temperature. But they are more or less liable to cause spontaneous combustion. This is particularly true of linseed oil, and in cleaning or polishing any article with these oils great care should be taken to destroy the waste or rags which are used in wiping.

To demonstrate the danger of fire of this nature take a piece of waste, saturate it with linseed oil, rub it between your hands and then throw the waste where it can do no harm and watch

it. In a few moments you will see smoke arise, and, if you wait long enough, the waste will blaze up. And you can imagine the result if that waste or rag was in a bin of waste or other inflammable material.

All paints contain either mineral or saponifiable oils, and some paints contain some kind of vegetable oil. So paints and varnishes are either explosive or they add to the danger of fire by spontaneous combustion if not handled properly.

A barrel of oil or paint found leaking in the store room or in a car, whether it is a commercial or company shipment, should be reported immediately. The barrel may contain volatile oil, and if the journal of the car runs hot and the waste in the box catches fire instead of a hot box we have a box car or a train on fire.

If the barrel contains linseed oil or varnish it may bring out the same result by friction or spontaneous combustion. It is not only in the leakage of barrels that this danger may arise, but frequently we set aside barrels that are supposed to be empty, and yet contain enough oil to start a fire if not properly handled. So before shipping empty barrels or drums in which paints or oils have been stored or using them for other purposes care should be taken to see that all residue is removed.

#### A DEVICE FOR LOADING TIES.

It is the practice at the timber treating plant of the Buffalo, Rochester & Pittsburgh at Bradford, Pa., to store the ties that are treated during the winter months and ship them out during the spring as they are required. Previous to this year these ties have been loaded into cars by hand, but the scarcity of laborers during the past season left only enough men to keep the plant in continuous operation and the device described here-



Tie Loading Device With Six Ties.

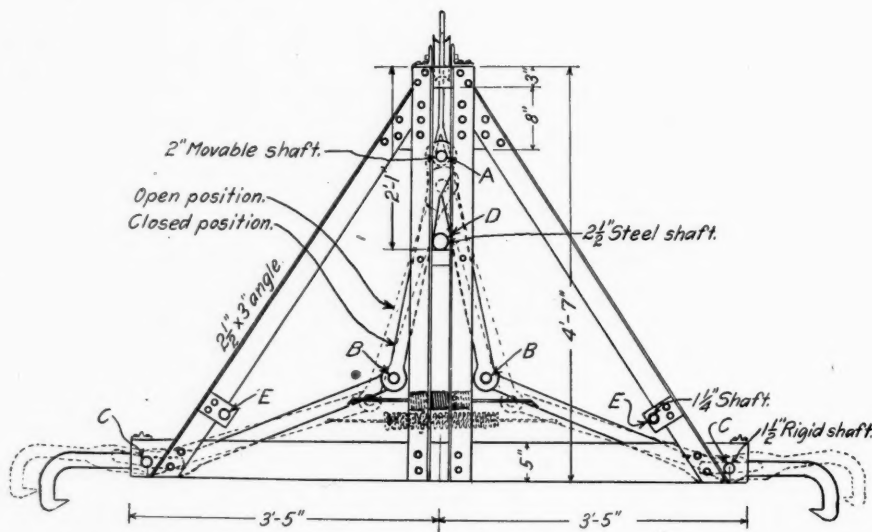
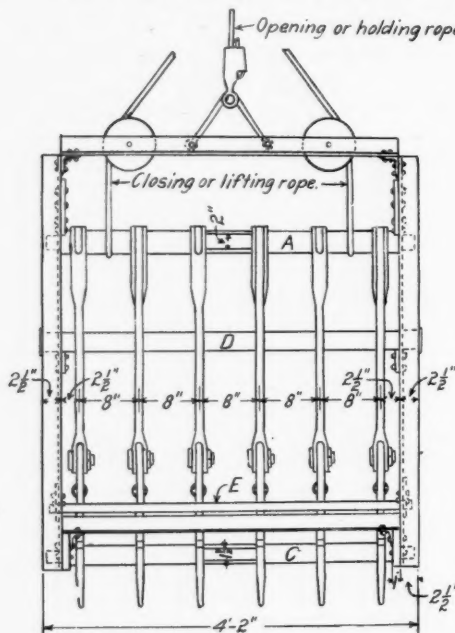
with was made to handle this material economically in connection with the Brownhoist locomotive crane.

As shown in the illustrations, this device consists essentially of a built up frame with six pairs of arms, six pieces of steel shafting and six coil springs. Two vertical angles on each side of the frame serve as guides for a movable shaft A, to which are fastened six pairs of arms which act as a unit. Each arm is joined independently at B, while the shafts C pass through the slots in the lower arms and are rigidly fastened to the sides

of the frame. The shafts E and D are also rigid and fastened to the frame.

This device is operated on the two-rope plan, the closing and lifting rope being connected to the shaft A and the opening and

from 8 ft. 2 in. to 8 ft. 10 in. in one lift. The opening or discharging of the load is merely the reverse of the closing. The opening rope holds the frame and the shaft A is allowed to drop, bringing the upper arms into contact with the shaft D, which



A Device for Loading Ties.

holding rope to the frame. As the shaft A is raised from the open position the springs attached to each lower pair of arms keep the upper arms in contact with the shaft D until the points of the hooks come in contact with the ties, the slots in the lower arms permitting them to slide on the shaft C. After the hooks

forces them apart and the hooks outward allowing the load to drop.

It has been found economical to use three men with this machine, two to guide it on the pile and one in the car. While this device was built because of the scarcity of labor it has been found that it is economical as well in handling the work for which it was designed. Ties had been previously loaded by extra gangs and later by piece workers. While the latter method effected a considerable saving, a further saving of 40 per cent. over the piece work rate was made by the use of this device. It was designed and built under the supervision of G. S. Harden, superintendent of the timber preserving plant of the B. R. & P.



Side View of Tie Loading Device.

come in contact with the ties the shaft A continues to rise until the pair of arms holding the longest tie touch the stops E. The purpose of the springs is not to lift the ties but merely to pull the hooks into contact with them. The stops E are located so that the shaft A will rise to the closed position before the load is lifted, thereby permitting the handling of ties varying in length

## NEW YORK PUBLIC SERVICE COMMISSION STUDYING TRANSVERSE FISSURES IN RAILS.

The failure of rails caused by internal transverse fissures is considered of sufficient importance by the New York Public Service Commission of the Second district to warrant the issuing of a recent order requiring the roads to furnish to the commission an individual report of all rail failures in which this defect is found, whether an accident results from the failure or not. In addition to the information called for on form No. 202, which is to be used for this purpose, it is specified that the following questions shall be answered:

In what portion of the rail section did the fissure occur?

What is the size of the fissure?

Were any other fissures discovered in this rail?

If so, at what distance from the one first discovered and where located with respect to the gage side of the head?

Were any other rails situated in the track adjacent to this one removed because of transverse fissures?

Give small sketch of cross-section showing approximate location of fissure.

It is further ordered that the pieces of broken rails reported under this head are to be held for inspection at a convenient point and are not to be disposed of without the consent of the commission.



# CONCRETE TANKS ON THE BALTIMORE & OHIO.

## Details of Design and Construction of Two 100,000 Gallon Tanks of a Type That Is Receiving Increased Attention.

Concrete water tanks have been the subject of careful study on the part of the operating officials of the Baltimore & Ohio for some time, and experiments conducted for the purpose of determining their practicability have proved satisfactory. As a result two large tanks have been installed, one at Sir John's Run, W. Va., and the other at Chicago Junction, Ohio, both busy watering stations, the former in the eastern territory and the latter in the western section of the system. Other tanks of similar type will probably be built as requirements demand.

The concrete tank at Sir John's Run, which was the first installed, has a capacity of 100,000 gal., with an outside diameter of 25 ft. 10 in. and a total height of 74 ft. from the base of the foundation to the top of concrete under the eaves of the roof, 17 ft. of the base being underground. The tank is cylindrical in design. The bottom of the tank proper is at an elevation of 43 ft. 6 in. above the base of the footing and 30 ft. above the base of the rail. The portion of the tower below the tank floor is divided into a basement and first story, used as a pump room and for storage respectively. The outside diameter of the tank proper is 25 ft. 10 in., the inside diameter at the bottom 24 ft., and it is 30 ft. 6 in. high. The walls of the tank taper on the

extra heavy cast iron except that exposed to water in the tank above the floor, which is of wrought iron.

The foundation slab is 2 ft. 6 in. thick and 33 ft. 6 in. in diameter, reinforced with  $\frac{1}{2}$ -in. cold twisted lug bars, placed radially as shown on the plan, with  $\frac{1}{2}$  in. bars bent circular to act as distributing bars. The radial bars extend from the edge of the slab to points underneath the post or column, which is 7 ft. in diameter at the center of the tower, acting as a support for the tank bottom and as a covering for the pipes. The concrete used for the foundation was a 1:3:5 mixture. According to the designers the maximum pressure on the footing for dead load plus live and wind load on the tower will be one ton per sq. ft., the wind pressure being assumed as a 60 mile per hour gale, or about 20 lbs. per sq. ft. on a diametral section.

The portion of the cylindrical tower below the first floor line is 27 ft. 8 in. outside diameter, extending 17 ft. 6 in. above the top of footing. The walls are of 1:2:4 plain concrete, 2 ft. thick, with a 1 ft. 6 in. x 1 ft. 6 in. fillet placed on both sides of the wall at the footing. At the first floor line the supporting tower is decreased to a 1-ft. wall, of 25 ft. 8 in. outside diameter, reinforced with  $\frac{1}{2}$ -in. bars, spaced 6 in. on centers horizontally, and bent to the radius of wall near the outer surface. The bars are wired to the pipes used for hoisting frames for forms, no vertical bars being used in this portion. Special reinforcement, as shown, is provided for the portions of the wall acting as lintels over the door and window.

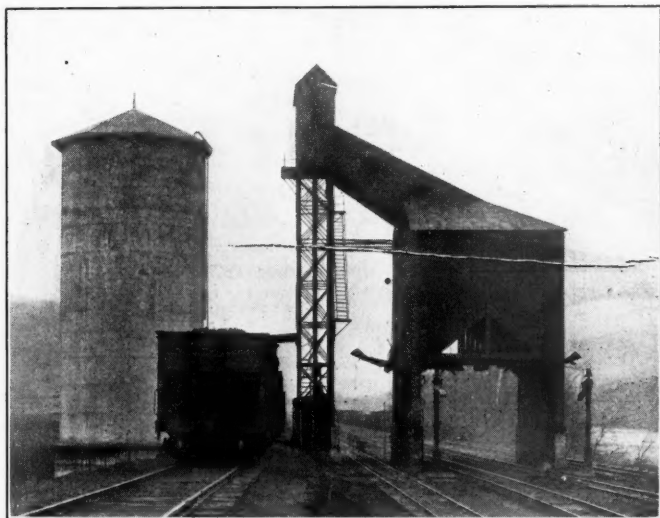
The post or column in the center of the tower is of plain concrete 7 ft. in diameter, and acts as a support for the first floor and also for the tank bottom. This post also acts as a support and protection for various supply and discharge pipes. At the bottom of the post is a 1 ft. 6 in. fillet to aid in distributing the load to the foundation.

The first floor at the entrance level is provided with an opening for a stairway to the basement and also with a 6 ft. square hatchway, with a 2-in. plank cover. The first slab is 6 in. thick reinforced with  $\frac{1}{2}$  in. square bars, spaced 8 in. between centers in one direction.

The floor slab spans from the wall to beams 2 in. wide, extending 6 in. below the slab, parallel to a diameter through the hatchway and stair opening. These beams are reinforced with three  $\frac{3}{4}$  in. square bars 24 ft. long. Cross beams of the same depth reinforced with three  $\frac{3}{4}$  in. square bars, 7 ft. long, are placed at the ends of the hatchway and on the side of the stair opening. A 1:1 cement finish was put on the floor before the 1:2:4 concrete of the slab had set.

The slab forming the tank bottom is 8 ft. 8 in. thick at the junction with the shell of the tank, with a slope toward the center for drainage. The reinforcement consists of 32 10-in. 25-lb. I-beams, 9 ft. 8 in. long, placed radially from the wall to the 7-ft. diameter post at the center. At right angles to the I-beams are a series of ten concentric circles of  $\frac{1}{2}$ -in. bars, bent over the top of the I-beams and extending down to a point near the bottom of the slab between the beams. Additional radial reinforcement is provided by placing two  $\frac{1}{2}$ -in. radial bars, wired to the circular bars, between the I-beams and bent up into the tank walls.

The walls of the tank have a thickness of 10 in. at the bottom, tapering on the inside to 7 in. at the top, the outside surface being vertical. The reinforcement consists of horizontal bars bent to the radius of the tank with a sufficient number of vertical bars to support the horizontal bars properly. The vertical bars extend 1 ft. below the bottom of the tank into the supporting walls, while the horizontal bars are varied, a band of eight  $\frac{1}{2}$ -in. bars at  $2\frac{1}{2}$ -in. spacing being placed near the outside of the wall at the bottom of the tank. Above the bottom



Concrete Tank at Sir John's Run, W. Va.

inside from a thickness of 10 in. at the bottom to seven in. at the top. The available head at the base of rail is 60 ft.

The source of supply for this tank is a reservoir created by a dam across a mountain stream, a short distance from the tank. A 10-in. gravity pipe line from this reservoir conducts the water to the top of the tank, the discharge into the tank being regulated by an automatic float valve. By means of a by-pass connection the 10-in. gravity main can be turned into the 16-in. discharge line and so controlled by valves as to feed into the tank or direct to the two penstocks which are located so as to serve four tracks. By this arrangement the supply is not shut off from the penstocks when sediment is being cleaned out of the tank.

The 16-in. discharge pipe starts at the bottom of the tank, the end being equipped with a cast-iron strainer. In the basement the 10-in. by-pass from the gravity supply previously mentioned is connected by valves to the discharge pipe, which is cut down to 10 in. beyond the first penstock.

A pump with an 8-in. suction pipe to the river nearby affords an auxiliary supply. A 6-in. waste pipe with an inlet at the top of the tank takes care of overflow in case the float valve does not work. This waste pipe has a branch at the bottom of the tank to dispose of sediment when cleaning out. All piping is of

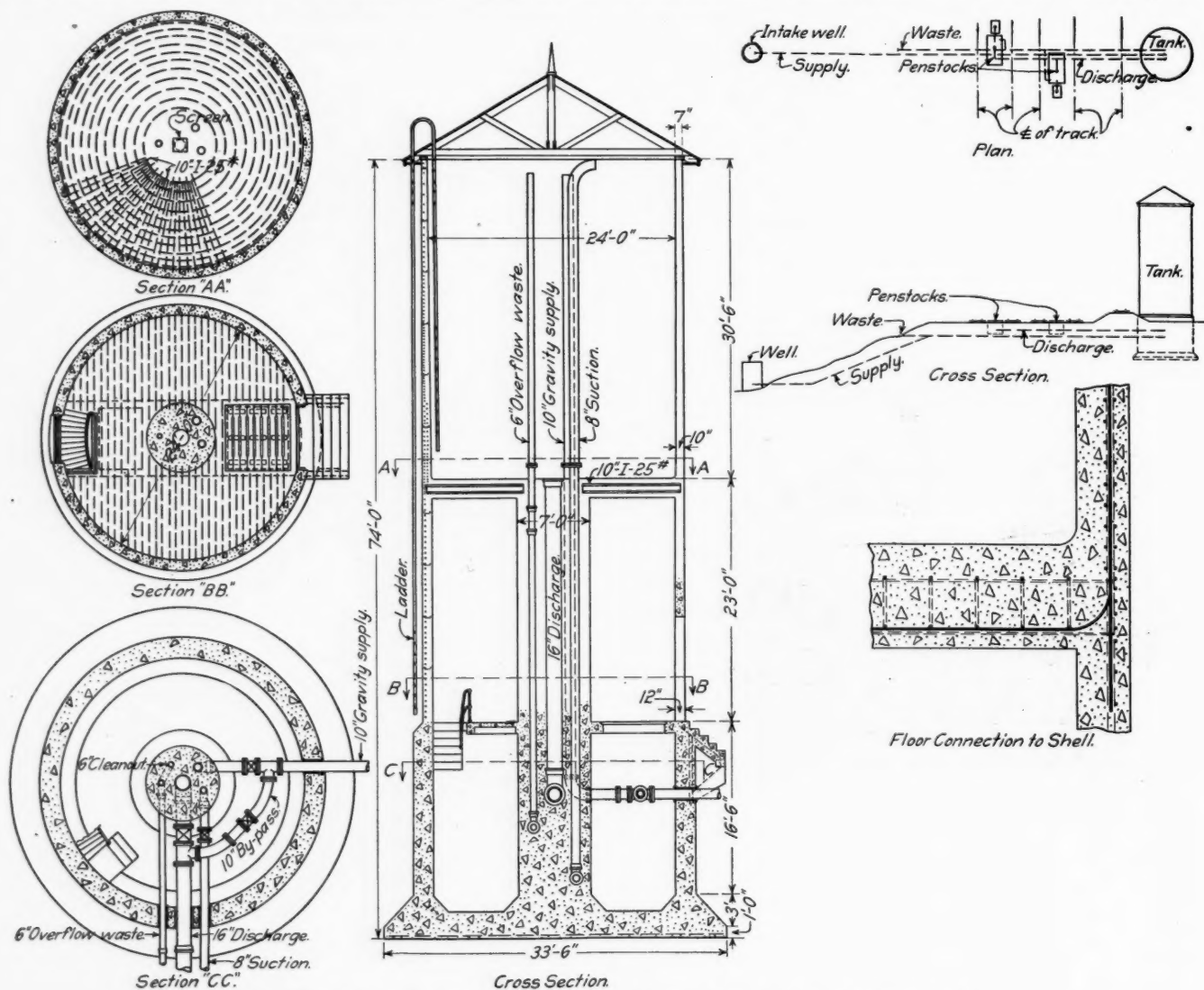
for a distance of 2 ft. 5 $\frac{3}{4}$  in. a double circle of  $\frac{1}{2}$ -in. bars at 4 $\frac{1}{4}$ -in. spacing is used with a 4 $\frac{1}{2}$ -in. spacing for a double circle of  $\frac{1}{2}$ -in. bars for 3 ft. above this. Then a section 4 ft. 1 in. in height is reinforced with a double circle of bars with 2 $\frac{1}{2}$ -in. alternate spacing. Above this point is a single circle of  $\frac{1}{2}$ -in. bars is used with spacing varying from 3 in. to 12 in. near the top.

The unit stress used in the steel for design was 16,000 lbs. per sq. in., no tension to be taken by the concrete. The tank and tower were designed for stresses due to a wind pressure of 20 lbs. per sq. ft. on a diametral section in addition to the dead load of the concrete and the weight of water in the tank. The actual mixture of concrete used was 1:1 $\frac{7}{8}$ :3 $\frac{1}{2}$  in order to obtain a very dense mixture, a 1:2:4 mix having been called for in

two coats of Bay Stone cement coating, as made by Wadsworth, Howland & Co., of Boston, Mass. The color for the outside coating to be natural cement or Bedford limestone grey.

"Work shall be arranged so that all concreting shall be completed to stopping points indicated and under no circumstances shall work be stopped below these points. A bond shall be formed at these points around the entire circumference of the previously built wall by thoroughly cleansing it with a stiff wire brush and clean water, and coating the same with a proper mixture of cement, hydrated lime and water; thereafter immediately proceed to concrete and continue until wall forms are filled.

"All reinforcing bars are to be of sizes shown on drawing, but to be material made by the Corrugated Bar Company, of St.



Details of Baltimore & Ohio Concrete Water Tank at Sir John's Run, W. Va.

the specifications. For waterproofing three pounds of hydrated lime was mixed with each sack of cement.

The following extracts from the specifications as to concrete, waterproofing bond and reinforcing steel are of interest.

"The concrete footing course shall be a 1:3:5 mixture. All other concrete shall be a 1:2:4 mixture, thoroughly mixed and carefully placed in the forms. The concrete used is to be a pure Portland cement and to stand all tests as recommended by the American Society for Testing Materials. The sand to be clean and sharp. The coarse aggregate shall be gravel or broken stone in size suitable for the best workmanship.

"Add to the entire concrete mixture a proper percentage of hydrated lime, and the entire inside and outside surface of the tank and the outside of the outer supporting wall is to be given

Louis, Mo., and to be cold twisted lug bars; if bent, they are to be true. Laps are to be at least 30 diameters, and wired to keep them in place with No. 12 annealed wire. Laps shall be staggered. All other reinforcing shall be as shown on the drawing.

"The horizontal circular rods in the tank shall be in two lengths, with a lap of 30 diameters and each lap shall be firmly spliced with one Crosby pattern cable clip, of proper size. Clip splices shall be staggered.

"All reinforcing is to be carefully placed and held rigidly in place while placing concrete. The horizontal and vertical rods are to be thoroughly wired together the entire height of the tank proper, and the rods in the tank bottom are to be bent upwards and clipped to the others. All reinforcing bars are to be of



high carbon steel of a guaranteed elastic limit of 55,000 lbs. per sq. in., and an ultimate strength of 100,000 lbs. per sq. in."

The roof is of wood construction covered with a composition roofing. A 4 in. x 8 in. yellow pine plate of several sections is bolted to the top of the tank wall. Upon this plate is a cross frame composed of four pieces of 3 in. x 8 in. yellow pine framed at right angles to an 8 in. x 8 in. center post, which they support. Eight main rafters of 3 in. x 8 in. yellow pine are framed to the plate and center post. Two 3 in. x 8 in. jack rafters are placed between each two main rafters. A 2 in. x 6 in. fascia is nailed to the ends of the rafters which are cut to form an octagonal roof. Hemlock sheathing, one inch thick, is placed on the rafters and a composition roofing upon this. A hatch in the roof provides access to the interior of the tank by means of an iron ladder extending from the ground to the top of the tank on the outside and to the bottom of the tank on the inside. The tank is also provided with a water depth indicator.

The forms used in the construction of the walls of this tank were of the McCoy patent, self-supporting sheet steel type. They were built in sections 5 ft. 6 in. high, five sections to the circumference, with expansion joints at the connections of the sections. The sections, composed of 3/16-in. steel plates, were reinforced with 3 in. x 3 in. x 3/8-in. angles at the top, bottom and ends. The sections were held with clamps to give a proper thickness of wall, and bolted together at the ends, the bolts passing through holes in the outstanding legs of angles riveted to the ends of the sections.

The forms were raised after a section about 5 ft. 4 in. high was poured (about 2 in. of the bottom forms projecting over the previous section to hold the forms) by means of chains run through differential pulley blocks and fastened to the top of the forms. The pulleys are swung from a cross block at the top of two wrought iron pipes embedded in the concrete previously poured. Two hoists are required for each section of forms.

No staging was required where these forms were used. A platform the size of the inside of the tank was supported by 2 in. x 10 in. timbers, placed radially, resting on the top of the forms, incidentally holding them plumb, and held by a sleeve on an iron pipe at the center. This afforded space enough to carry on concreting and placing the bars. Short ladders were hung on the outside of the forms at the joints of the sections to allow the men to loosen and tighten the joints while raising and setting the forms.

A hoist for concrete was formed by a pulley block and tackle supported by two pipes embedded in the walls and tied to the center pipe. The concrete was hoisted in buckets, by the mixer engine by means of a special hoisting attachment. The concrete was mixed in a Polygon batch mixer operated by a gasoline engine. The sand and crushed stone were shipped in cars, unloaded at the site of the tank and conveyed to the mixer in barrows. The concrete was mixed in such proportions as was found by test to occupy the least volume for a given amount of materials.

After being hoisted to the working platform the concrete was dumped into trough-like boxes with sloping spouts, from which it was shoveled into forms wherever desired.

One 5 ft. 4 in. section of wall was poured each day, the forms being raised, reinforcement placed, the top surface of the concrete treated as described under the specification, and the next section then poured. The center supporting column for the tank bottom was carried up at the same time the walls were being built.

The forms for the tank bottom were so constructed as to allow their keying up after concreting had commenced to avoid the settling of the deck from the compression of the timbers, thereby avoiding displacement of materials or disturbance of the concrete while setting. This deck was left under the tank floor for seven days after placing the concrete.

The capacity of the tank at Chicago Junction is also 100,000 gal. and it is of the same diameter as that at Sir John's Run,

but the height of the tank bottom above the base of the rail is greater, being 50 ft. as against 30 ft. for the latter. The height over-all from the bottom of the concrete foundation, which is 33 ft., 6 in. in diameter, to the top of the tank walls is 93 ft. 6 in. The structure is divided into three stories, the basement being used as a pump room, the second floor for storage, and the third story as the actual tank.

The tanks were designed and constructed under the supervision of F. L. Stuart, chief engineer; and M. A. Long, assistant to the chief engineer, Baltimore & Ohio. The Steel Concrete Construction Company, of Pittsburgh, Pa., which owns the patents on the tank forms and concrete hoists, designed and constructed both tanks.

## SUGGESTIONS FOR SAFETY IN THE MAINTENANCE OF WAY DEPARTMENT.

By B. H. MOON,

Roadmaster, Union Pacific, Rawlins, Wyo.

With the class of men now employed as track foremen, constant supervision on the part of the officers is necessary. If the standard book of rules for the trackmen was followed literally, no doubt 90 per cent. of the accidents would be prevented, but this is a difficult matter to constantly keep before the trackmen, and it therefore becomes the duty of the roadmaster to continually check the men under his supervision to know that there are no violations. In other words, the safety problem in the maintenance of way work resolves itself into the old saying that "eternal vigilance is the price of safety."

In starting the day's work, foremen should see that an inspection is made of all tools, appliances and hand cars so that they can know positively that there are no defects which may result in accidents. This is especially important with reference to defective tools, as many accidents occur because of the men not taking the time to make a few necessary repairs.

The most dangerous practice that we are now confronted with is connected with the handling of rails. In some instances, air operated rail loaders are furnished. In such instances the foremen should see that all working parts are in perfect order before starting work. The cables and rail tongs should be inspected and the stay chains extending from the corner of the car to the boom should be properly adjusted and secured. It is, of course, understood that the men used with this rail loader are organized so that each man knows exactly what is expected of him and performs his part of the work to perfection. Careful attention should be given to see that all rail or other material loaded is placed securely so that there is no danger of its falling from the car when in transit. Another feature of special application in connection with the handling of rail, but more or less true with the handling of other work, is that men should not be shouted at or spoken to in a boisterous and abusive manner, as this has a tendency to excite the more nervous ones and is apt to cause them to do things they would not do under ordinary circumstances.

Foremen, as well as other employees, should obey the rules requiring that no hand cars, push cars, motor cars or other material is left around or on station platforms. This practice is dangerous not only to employees but to passengers as well. Most stations are but poorly lighted and many injuries have occurred by people falling over material or cars left in this manner over night.

Men working on double tracks should clear both tracks in advance of an approaching train. Injuries frequently result from men stepping out of the way of a train on one track in front of one on the other. With a little practice in this direction the men soon become accustomed to it, although unless closely watched they will go back to their old habits. Track jacks should never be placed between the rails as a train may approach before the jack can be removed and an accident result. The foremen should always remain with their men as laborers

do not appreciate safety and are liable to injure themselves or other members of the gang by carelessness.

Foremen should be very particular when flagging trains and should know absolutely that the man assigned to protect a gang of men working on unsafe track is competent to perform this duty to the letter. The proper inspection of unsafe track should also be carefully watched by the foremen so that an accident will not occur because of defective or rough track. He cannot be too careful in the matter of issuing slow orders or protecting unsafe track with slow orders.

Hand or motor cars should not be run without members of the gang facing each direction so that the approach of a train will be noticed by some member of the crew in time to remove the car with safety. I believe that wherever available, the facts regarding accidents should be given to the men in the way of bulletins pointing out just how the accidents could have been prevented. This, no doubt, will have a tendency to cause the foremen to notice things of a similar nature if they exist on their sections.

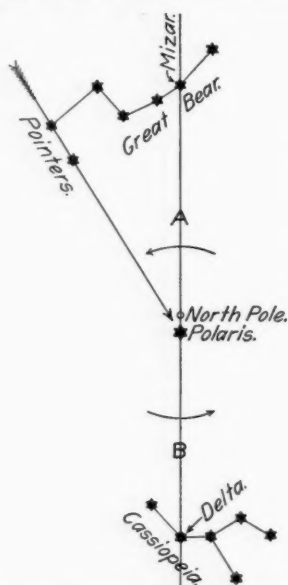
### SIMPLE METHOD OF OBTAINING TIME AND AZIMUTH.

By J. A. MACDONALD,

Topographical Surveys Branch, Ottawa, Ontario.

The usual method of obtaining azimuth from Polaris is by making observations at elongation. While the following method is not new it is not generally known and will be found much simpler in application and fully as accurate as the elongation method. No instrument is required and no nautical almanac or mathematical tables are needed.

This method is based on the fact that Polaris and two adjacent bright stars are in the same vertical plane only a



Relative Location of Polaris and Adjacent Constellations, Showing Vertical Line Through Three Stars for Determination of Azimuth.

few minutes before Polaris crosses the meridian. It can be used at only one moment in each 24 hours and it requires a fairly clear sky to enable the stars to be sighted behind a plumb line. The two stars that can be used in this observation are Mizar, the middle star in the tail or handle of the constellation known as the Great Bear or the Dipper, and Delta in the constellation Cassiopeia, commonly known as the Little Dipper. The former can be used only when it is below the pole during the night. When it passes the meridian above the pole it is too near the zenith to be of service, in which case the latter star is observed. The accompanying

diagram shows the principal stars of the constellations of Cassiopeia and the Great Bear with Delta Cassiopeia, Mizar and Polaris on the meridian. The following tables show the exact time at which these stars are in the same vertical plane on given dates. The time for other days can be secured by direct interpolation, the daily variation being four minutes. From January to June the observation is made with Mizar, and from July to December with Delta Cassiopeia.

	On line.		On line.
January 20 .....	5:22 a. m.	July 20 .....	5:30 a. m.
February 20 .....	3:20 a. m.	August 20 .....	3:28 a. m.
March 20 .....	1:30 a. m.	September 20 .....	1:26 a. m.
April 20 .....	11:24 p. m.	October 20 .....	11:24 p. m.
May 20 .....	9:26 p. m.	November 20 .....	9:22 p. m.
June 20 .....	7:24 p. m.	December 20 .....	7:24 p. m.

When it has been determined by observation that Polaris is in the same vertical plane with one of these stars it can be shown that it will pass the meridian 7.15 minutes later during 1913. This interval is increasing from year to year at the rate of 0.33 minutes so that in 1914 the interval will be about 7.5 minutes. The observation can be made either indoors or out by suspending an ordinary plumb line and marking the direction of the meridian by setting a second point at the stated interval after the two stars are in the same vertical plane.

The same observation may be used to determine local standard time by the use of the accompanying tables for time, adding four minutes for each degree if the place of observation lies west of the time meridian and subtracting the same for stations east of the meridian.

### A NOVEL AND EFFECTIVE CATTLE GUARD.

A type of cattle guard which is being used to a limited extent on the Arizona Eastern is probably the simplest and cheapest cattle guard ever constructed, and its efficiency is said to be even superior to much more elaborate and expensive types. The first one of these guards was put in service about six months ago, and it is said that no animal has ever crossed it or shown the slightest desire to investigate it, as it consists simply of a bed of



A Cactus Cattle Guard.

a small cactus that grows abundantly along that portion of the line and with whose thorns horses and cattle are thoroughly familiar. It is said that horses will shy from a patch of this cactus as they would from a rattlesnake. The bed is made, as the accompanying photograph indicates, of 2 in. x 6 in. timbers placed on edge. In the bottom of the box so formed is placed a few inches of sand and gravel in which the cactus is planted. This variety of cactus is said to be very long lived, and as the material grows in abundance nearby, it is not difficult to renew it if necessary. As the thorns will pierce an ordinary boot or shoe, it is necessary to place a piece of timber along the bottom bar of the fence of the guard to allow employees to cross. This cattle guard was devised by Arthur Moeller, foreman of section 8 at Fort Thomas, Ariz.



# MAKING SECTION FOREMEN FROM CLERKS.

A Unique Plan for Providing Competent Section Foremen by  
Utilizing Promising Young Men Who Now Leave the Service.

By WILLIAM S. WOLLNER.

In submitting this plan for providing section foremen from a heretofore untried source the originator has accepted without question the statements of officials of the track department that section, yard and extra gangs do not produce a sufficient number of men capable of assuming the duties of foremen to permit of all such positions being filled by the promotion of men already employed in the track department; that section foremen who have been promoted from among the laborers in section, yard and extra gangs are to a large extent inefficient; and that section foremen of foreign birth are not suited to the needs of American railroads.

The acceptance of these facts leads to the conclusion that it is useless to further investigate the track department as a possible source for the production of future foremen and that some plan for the educating of men who are to become foremen must be devised in order that men may be placed in charge of the maintenance units who are fully alive to the responsibilities resting upon them and of the economic efficiency it is possible for them to create by skilful management of the few miles of track placed under their immediate charge.

The need for providing more efficient section foremen in greater numbers than are now available having been brought to the writer's attention while he has under investigation possible means for the creation of greater efficiency in the conduct of executive and general offices, has caused him to consider these two problems with relation to each other, and has resulted in the presentation of this report, which does to a certain extent bear upon both questions now under investigation.

The executive and general offices of the company under consideration give employment to about 1,500 persons, all of whom are employed in one building situated in the heart of the business district of a city of 450,000 inhabitants. While the organization of the forces of the different departments changes from time to time it may be assumed that the general strength is as follows:

Female employees (stenographers, clerks, ticket counters, way-bill sorters, etc.).....	500
Experienced male clerks (chief clerks, secretaries, heads of bureaus, heads of desks, statisticians, accountants, etc.).....	180
Ordinary male clerks (stenographers, clerks working under the direct supervision of other clerks, messengers, etc.).....	670
Boys (between the ages of 15 and 19 years).....	150

Boys usually enter the employ of the railroad at the age of 15 years, the compulsory education law prohibiting their employment before that age. In order to maintain this force of 150 boys it is necessary to take twice that number into the service each year. About 50 of the boys taken into the service during a given year are promoted to clerical positions and the other 250 leave the service. The entrance salary is \$25 to \$30 per month, which increases to \$60 to \$65 after four or five years' service. No fixed schedule is maintained, the salary being regulated largely by the duties the boy is called upon to perform.

Although apprentice courses are now provided for boys working in the shops, in telegraph offices, etc., no effort is made to educate or train boys who enter the general office service, it being assumed that they will absorb sufficient knowledge of general office work from their surroundings; from contact with men who are performing the work they will later be called upon to do, and from brief instruction as to their new duties as they are advanced from one position to another. No attention is given to the advancement of their scholastic education, or to their physical or moral welfare. Briefly; a boy is taken into the organization with the understanding that he will either be promoted to a clerkship in his regular turn or that he will leave the service before his turn is reached; if he stays in the

organization the schooling he has already received, supplemented by the knowledge of his duties which he will gain through contact with the work he is called upon to perform, will be sufficient to enable him to render any service he may be called upon for during the term of his employment with the company.

Office work does not generally appeal to a boy. He accepts it as a means of earning a living during his youth, but it is seldom that a boy will admit a desire to spend his maturity in an office. Practical railroading does appeal to boys; take a normal boy through the shops or the yards and you will see his entire interest centered in what is going on about him. The experience of the writer has been that when a boy has once been introduced to the mysteries of railroading (on the road) he will usually express a desire to enter it as a life pursuit. In contradistinction to this the boy sees in the general offices men who have given the best part of their lives to the service of the company, their only return being a stunted physique and a very moderate financial return for their labor; and there are no stories of railroad presidents who have risen to fame via the general office route to hold a boy to his task when the opportunity for more interesting work outside the railroad field presents itself.

It has been the experience of accounting and other general officials that men inexperienced in railroad office work are very easily trained to perform the duties required of the clerks in the general offices and that it is not necessary to depend upon promotion to fill most of the vacancies that occur. This, of course, applies only to employees termed "ordinary clerks," it being understood that a considerable length of service is required before men can be placed in the class of "experienced clerks."

Under the present system of railway organization it may be said that the section gang and the general office form the two extremes of the service. The section man is in direct daily contact with the actual operation of the road, while the general office clerk is usually far removed from the scene of operation and is not in any way directly connected with the act of supplying transportation. To consider these two far-separated branches of the service with the idea of improving one or both by providing desirable material from the personnel of the other is unusual, and as far as the writer has been able to ascertain, original; but an observation of both branches of the service during some years of intimate connection with the track department and the general office leads him to believe that the task is not impossible.

The suggested plan is that apprentice courses leading to positions as section men be established in order that a sufficient number of properly trained young men may be available from which selection may be made to fill vacancies as they occur, but that instead of classes being conducted on the road where the subject presented has its practical application, that they be an adjunct to the general offices so that boys employed there may avail themselves of the opportunity to acquire sufficient theoretical knowledge of railroading to permit of their entering the operating department through the medium of the section gang.

The course would, of necessity, have to be divided into two parts, that which could be conducted in the class-room and that which must be taught on the road, and it is with this idea in mind that the writer has taken advantage of the presence of available material in the general offices from which to draw students, it being assumed that by the time this course was completed the instructor would have had sufficient opportunity to determine whether a young man was of the type from which

it is possible to produce successful foremen. For the purpose of this preliminary plan it is assumed that five hours a week for one year would constitute the first, or theoretical, part of the course and that eight hours a day for six months would be required for the second, or practical part.

No boy should be selected as an apprentice until he had passed his eighteenth birthday and has been at least two years in the company's service. He should be recommended as an apprentice by the official under whom he is employed and his physical qualifications should be certified to by the company's surgeon before he is admitted to the course. It might be found advisable to require candidates to pass a mental, or educational, test in addition to the above. In any event no boy should be admitted to the classes until it had been fully determined that he was in every way qualified to properly perform the duties of a section foreman.

Classes should be held during the early morning hours, so that the students would not be fatigued by their regular work. The first subject taught should be "section mathematics," which should include all the special arithmetic that it is necessary for a foreman, supervisor or roadmaster to know. Determining the degree of curve, turnout angle, frog number, etc., should be important parts of this subject, as should also be the theory of simple trusses. After the mathematical course is completed "section accounting" should be taught and stress should be laid upon how the keeping of proper accounts assists the foreman, as well as the official, in determining whether he is doing his work in the most efficient and economical manner. The use of roadway reports in the division and general offices should be explained and illustrated. Visits with the instructor to offices where these reports are used will serve to illustrate their value in a very effective manner, and to impress upon the student the necessity for their being properly submitted.

The manufacture and care of tools and material should next follow. Proper attention to this part of the course will prevent much abuse to rail and fastenings, improper handling of creosoted timber, etc., which now occur through the ignorance of the foreman. The manufacture of tools and tool sharpening should be introduced also, and visits should be made to foundries and machine shops in order that the boys may learn how the various tools and material used on the section are made.

The success or failure of this plan will depend more upon the selection of the instructors than upon any other single thing. A man who combines a knowledge of practical railroad work with a knack of keeping boys interested in their studies, as well as the ability to teach the necessary subjects should be obtained for the class-room work; a young, energetic roadmaster or assistant roadmaster should be selected for teaching the practical branches. Their work should be supplemented by frequent talks by officials and others on special subjects, and all officials and employees should be subject to call for this work. Any boy who does not show the proper interest in his studies or who does not, through fault of his own, regularly attend classes and perform the work required of him outside of office and class hours should be promptly dropped from the company's service. Heads of offices and departments should be made to understand the importance of boys attending classes regularly and should assist the instructors in every possible way.

A section close to town and easily reached by street car (so that the boys might still live at home) should be reserved for instruction purposes, and when a boy had completed his class-room work he should be assigned to the gang on this section. Boys should be required to report for duty at eight in the morning and quit at five in the evening, and be allowed an hour in the middle of the day for lunch. This section gang should be made up entirely of apprentices and, as stated above, should be in charge of the best roadmaster or assistant roadmaster that the road can produce. It is of the utmost importance that he be in entire sympathy with the object sought, and it is desirable that he be a technical graduate. Six months' service under such a man, together with the occasional night classes and

lectures that he would be required to attend should make a first-class section laborer out of any boy. If he started his apprenticeship when he was 18 he would be nearly 20 years old when he finished his course on this section, and although this is much younger than our present foremen, youth should increase his efficiency rather than detract from it. A boy who has spent 18 months at hard study and labor is more likely to regard his work as something of especial importance to himself and to the company than is a foreman who is merely working for the small wage paid for this class of work.

A few sections adjoining the apprentice section should be manned with regular section laborers, but the foremanship should be reserved for graduates of the apprentice section. Here the young foreman would still be under the eye of the instructor and would have him to appeal to in case of need. Some such steadying influence would be very much needed when an apprentice was first given authority over others, and the foremanship of these sections would form a very desirably intermediary between the apprentice section and the section that he would eventually have charge of out on the road.

While a boy is attending classes he should be paid at the same rate as other boys doing the same work and not attending classes. No deduction should be made for the time he is in classes, nor for instruction or supplies. While upon the experimental section he should be paid at the same rate as is paid regular section laborers, and when he is placed in charge of a section at the same rate paid other section foremen. After the first year, however, his rate should be advanced \$5 per month, and a similar increase should be made every third year thereafter until he reaches a rate of \$90 per month. This will be after eight years, so the boy will now be 29 years old. The fact that there are not many men 29 years old in the general offices who are earning \$90 per month, house rent, fuel, light and water, together with the physical benefit that will accrue to the boy, is all that need be said about the social aspect of this plan. There is also the further probability that if he possesses the proper ability a boy will have advanced to the foremanship of an extra gang or have become a roadmaster by this time and that he will continue up the official ladder to assistant superintendent, superintendent, and to the final height that his ability makes possible.

This plan is presented merely as a preliminary report, and much careful thought and study will have to be given to this subject before it can even be given a trial. It is understood that after the experiment has started many changes will have to be made to fit it to conditions that are bound to arise and that many boys who will be enrolled as apprentices will not complete their courses, or if they do complete them will not prove satisfactory foremen. But that the experiment is worth a trial is based upon the facts that competent foremen are very badly needed in greater numbers than are now available, that most of the other schemes for providing competent foremen have failed, and that this plan provides for the training of roadway officials along scientific lines which should tend toward the more efficient operation of the railroad as a whole.

**RAISING TRACK OR BUILDING TRESTLE.**—In making the embankments for the track elevation work of the New York, Chicago & St. Louis in Cleveland, as described by A. J. Himes, engineer of grade elimination in Bulletin No. 160 of the American Railway Engineering Association, the tracks were raised by jacking up on the fill rather than building temporary trestles, after making an estimate of costs. The embankment to be built was about 2,080 ft. long with an average depth of 13 ft. and contained 40,000 cu. yds. of material. The trestle would have cost not less than \$9.40 per ft. or a total of \$19,552. Assuming a credit of \$3.25 per ft. for stringers and ties and deducting this total of \$6,760, the net cost of the trestle would have been \$12,792. The cost for labor used in making the fill by raising was \$0.10 per cu. yd., or a total of \$4,000, which is less than one-third the estimated cost of the trestle.



## THE BRANDING AND HEAT NUMBER STAMPING OF STEEL RAILS.

At this time when increased attention is being given to the compilation of accurate records of rails, especially failed rails, the following information concerning the methods of branding and stamping the heat numbers at the various mills, prepared by Robert W. Hunt & Company, and published in a small booklet by the Railway Supply Company, Chicago, will be of interest.

The brand on rails gives the name of the manufacturer, a number or abbreviation by which the rail section is designated, the month and year of manufacture, and if the metal is open hearth steel, the letters "O. H." are also added. Sometimes the letters "F. T." are added to signify ferro-titanium steel. Square block letters and figures about an inch high are commonly used, and as these are cut into one of the rolls of the last pass, the brand will always appear slightly raised at regular intervals on

the rail length, or it may be shown only once or twice, according to mechanical conditions of the mill.

The letter showing the position of the rail in the ingot is sometimes stamped on by hand, in which case a die is held on the web and struck with a hammer, but generally it is applied by the same or another machine that stamps the heat number. Of course, if the dies become worn or slightly twisted, the figures and letters are bound to be indistinct.

The following is intended to serve as a guide for correctly locating and reading heat numbers and letters and gives the practice employed at each rail mill.

*Algoma Steel Company.*—Bessemer heat numbers contain from one to five figures and open hearth heat numbers generally contain four figures. These numbers are stamped at least three times on the unbranded side of the rail. The mill does not make a practice of adding the rail letter.

*Bethlehem Steel Company.*—There are always five figures in

Section No.	Wt. Rail	Base Inches	Height Inches	Tread Inches
600	60*	4 1/4	4 1/4	2 3/4
600-X	60	4 1/4	4 1/4	2 3/4
650	65*	4 1/4	4 1/4	2 3/4
653	65	4 1/4	4 1/4	2 3/4
654	65	4 1/4	4 1/4	2 3/4
700	70*	4 1/4	4 1/4	2 3/4
701	70	4 1/4	4 1/4	2 3/4
721	72	4 1/4	4 1/4	2 3/4
722	72	4 1/4	4 1/4	2 3/4
741	74	4 1/4	4 1/4	2 3/4
750	75*	4 1/4	4 1/4	2 3/4
752	75	4 1/4	4 1/4	2 3/4
753	75	4 1/4	4 1/4	2 3/4
754	75	4 1/4	4 1/4	2 3/4
775	77.5	5	5	2 3/4
781	78	5	5	2 3/4
798	79	5 1/2	8	2 3/4
800	80	5	5	2 3/4
801	80	5	5	2 3/4
802	80	5	5	2 3/4
803	80†	4 1/2	5 1/2	2 3/4
8032	80†	4 1/2	5 1/2	2 3/4
804	80	4 1/2	5	2 3/4
817	81	6	7	2 3/4
850	85*	5 1/2	5 1/2	2 3/4
851	85	5	5 1/2	2 3/4
852	85	5	5	2 3/4
853	85	5 1/2	5 1/2	2 3/4
8530	85	4 1/2	5 1/2	2 3/4
8531	85	4 1/2	5 1/2	2 3/4
855	85	5 1/2	5 1/2	2 3/4
900	90*	5 1/2	5 1/2	2 3/4
901	90	5	5 1/2	2 3/4
902	90	5	5	2 3/4
903	90	5 1/2	5 1/2	2 3/4
9030	90	5	5 1/2	2 3/4
9031	90†	5 1/2	5 1/2	2 3/4
9032	90†	4 1/2	5 1/2	2 3/4
9033	90	5 1/2	5 1/2	2 3/4
911	91	5 1/2	5 1/2	2 3/4
951	95.4	5 1/2	5 1/2	3
957	95	6	7	3
1000	100*	5 1/2	5 1/2	2 3/4
1001	100	5 1/2	6	2 3/4
1002	100	5 1/2	6	2 3/4
1003	100	5 1/2	6 1/2	2 3/4
10030	100	5	5 1/2	2 3/4
1031	100†	5 1/2	6	2 3/4
1005	100	5 1/2	5 1/2	2 3/4
10130	101	5 1/2	5 1/2	2 3/4
1051	105	5 1/2	6	3

Section No.	Weight Rail	Base Inches	Height Inches	Tread Inches
514	60	3 1/2	4	2 1/2
509	60	4 1/4	4 1/4	2 1/2
527	60	4 1/4	4 1/4	2 1/2
571	60†	3 1/2	4 1/4	2 1/2
568	60†	4	4 1/2	2 1/2
533	60*	4 1/4	4 1/4	2 1/2
518	65	4 1/4	4 1/4	2 1/2
534	65*	4 1/4	4 1/4	2 1/2
515	67	4 1/4	4 1/2	2 1/2
547	66	4 1/2	4 1/2	2 1/2
516	68	4 1/2	4 1/2	2 1/2
532	70*	4 1/2	4 1/2	2 1/2
504	70 and 72	4 1/2	4 1/2	2 1/2
570	70†	4 1/4	4 1/4	2 1/2
567	70†	4 1/4	4 1/4	2 1/2
528	75	4 1/4	4 1/4	2 1/2
529	75*	4 1/4	4 1/4	2 1/2
530	80*	5	5	2 1/2
540	80	4 1/2	5	2 1/2
543	80	5	5 1/2	2 1/2
569	80†	4 1/2	4 1/2	2 1/2
566	80†	4 1/2	5 1/2	2 1/2
506	85	5	5	2 1/2
500	85	5	5	2 1/2
531	85*	5 1/2	5 1/2	2 1/2
559	85	4 1/2	5 1/2	2 1/2
561	90†	4 1/2	5 1/2	2 1/2
563	90†	5 1/2	5 1/2	2 1/2
535	90*	5 1/2	5 1/2	2 1/2
550	95*	5 1/2	5 1/2	2 1/2
558	100	5	5 1/2	2 1/2
520	100	5 1/2	5 1/2	2 1/2
564	100†	5 1/2	5 1/2	2 1/2
565	100†	5 1/2	6	2 1/2
536	100*	5 1/2	5 1/2	2 1/2
572	110	5 1/2	6	2 1/2
573	120	5 1/2	6 1/2	2 1/2
574	130	6	6 1/2	2 1/2

Section No.	Wt. Rail	Base Inches	Height Inches	Tread Inches
6001	60	4 1/4	4 1/4	2 3/4
6501	65	4 1/4	4 1/4	2 3/4
7001	70	4 1/4	4 1/4	2 3/4
7501	75	4 1/4	4 1/4	2 3/4
8001	80	5	5	2 3/4
8002	80	5	5 1/2	2 3/4
8003	80	5	5	2 3/4
8501	85	5	5 1/2	2 3/4
10001	100	5 1/2	5 1/2	2 3/4

Section No.	Wt. Rail	Base Inches	Height Inches	Tread Inches
603	60*	4 1/4	4 1/4	2 3/4
653	65*	4 1/4	4 1/4	2 3/4
701	70*	4 1/4	4 1/4	2 3/4
753	75*	4 1/4	4 1/4	2 3/4
754	75	5	5	2 3/4
756	75	4 1/4	4 1/4	2 3/4
757	75	4 1/4	4 1/4	2 3/4
800	80*	5	5	2 3/4
801	80†	4 1/2	5 1/2	2 3/4
850	85	5 1/2	5 1/2	2 3/4
851	85*	5 1/2	5 1/2	2 3/4
852	85	5 1/2	5 1/2	2 3/4
853	85	4 1/2	5 1/2	2 3/4
900	90*	5 1/2	5 1/2	2 3/4
902	90†	5 1/2	5 1/2	2 3/4
903	90	5 1/2	5 1/2	2 3/4
904	90	5	5 1/2	2 3/4
905	90†	4 1/2	5 1/2	2 3/4
950	95*	5 1/2	5 1/2	2 3/4
1000	100*	5 1/2	5 1/2	2 3/4
1002	100†	5 1/2	5 1/2	2 3/4
1100	110*	6 1/2	6 1/2	2 3/4

\*Indicates ASCE section rails.  
†Indicates ARA series A section rails.  
‡Indicates ARA series B section rails.

the web of the rail. The month is generally shown by Roman numerals, as VII for July, and sometimes by a series of 1's, as 11111 for May.

The number representing the heat, blow or melt of steel, and the letter to indicate the position of the rail in the ingot, is stamped on the web of the rail with dies while it is still red hot, but after it has been completely rolled and sawed to length. All mills except Pennsylvania and Colorado stamp the heat number and letter on the side of the web which does not carry the brand. Remembering also that the brand always appears in raised letters, and that the heat number and letter is stamped on, no confusion of the two should exist. Except at the Lorain mill, the heat number is always applied by dies carried on a wheel which revolves, so that when brought into contact with the moving rail, the numerals on the face of the dies are stamped on the web. It may be repeated, therefore, several times on

the heat number, which is stamped at least once on the unbranded side of the rail, generally near the center. Sometimes there is a letter in front of the heat number to indicate a furnace, and this should not be confused with the rail letter, which follows the heat number and is stamped by the same machine. Typical stamping would be B18495 C, which would mean the C rail from this particular heat and furnace.

*Cambria Steel Company.*—Bessemer heat numbers may contain from one to five figures, and open hearth heats always contain five figures. These numbers are stamped at least twice on the unbranded side of the rail. The rail letter is stamped by a separate machine, so that it usually appears about six times on the rail length, and can be easily located.

*Carnegie Steel Company (Edgar Thompson Works).*—Bessemer heat numbers may contain from one to five figures, and open hearth heats always five figures. These numbers are

stamped at least three times on the unbranded side of the rail, but the rail letter is stamped on by hand, generally twice near one end, so that it will be near the joints.

**Colorado Fuel & Iron Company.**—There are from one to four figures in the heat number, which is stamped at least twice on the branded side of the rail. The branding and stamping may

come together and cause some confusion. The rail letter is stamped on by hand at least once near one end of the rail, so that it will be near the joints.

**Dominion Iron & Steel Company.**—There are always four figures in the heat number, which is stamped at least twice on the unbranded side of the rail. The rail letter is stamped on

### Tennessee Coal & Iron Company

Sec. Nos.		Wt. Rail	Base Inches	Height Inches	Tread Inches
Old	New				
600	6040	60*	4 1/4	4 1/4	2 3/4
650	6540	65*	4 1/4	4 1/4	2 3/4
700	7040	70*	4 1/4	4 1/4	2 3/4
702	702	70*	4 1/4	4 1/4	2 3/4
750	7540	75*	4 1/4	4 1/4	2 3/4
752	7523	75	5	5	2 3/4
753	75	75	5	5	2 3/4
754	75	75	4 1/2	4 1/2	2 3/4
755	75	75	4 1/2	4 1/2	2 3/4
800	8040	80*	5	5	2 3/4
850	8540	85*	5 1/4	5 1/4	2 3/4
854	85	85	5 1/4	5 1/4	2 3/4
855	85	85	5 1/4	5 1/4	2 3/4
900	9040	90*	5 3/8	5 3/8	2 3/4
901	9023	90	5 3/8	5 3/8	2 3/4
902	9020	90†	5 3/8	5 3/8	2 3/4
903	9030	90†	5 3/8	5 3/8	2 3/4
904	90	90	5 3/8	5 3/8	2 3/4
1500	150	150	6	6	4 1/4

### Carnegie Steel Company

Sec. Nos.		Wt. Rail	Base Inches	Height Inches	Tread Inches
Old	New				
60A	6040	60*	4 1/4	4 1/4	2 3/4
60H	6033	60	4 1/4	4 1/4	2 3/4
60K	60	60	4 1/4	4 1/4	2 3/4
60M	60	60	4 1/4	4 1/4	2 3/4
60P	60	60	4 1/4	4 1/4	2 3/4
60R	60	60	4 1/4	4 1/4	2 3/4
60ra	6020	60†	4 1/4	4 1/4	2 3/4
60rb	6030	60†	3 1/4	4 1/4	2 3/4
61A	61	61	4 1/4	4 1/4	2 3/4
63H	63	63	4 1/4	4 1/4	2 3/4
63J	63	63	4 1/4	4 1/4	2 3/4
65A	6540	65*	4 1/4	4 1/4	2 3/4
65G	65	65	4 1/4	4 1/4	2 3/4
66B	66	66	4 1/4	4 1/4	2 3/4
66K	66	66	4 1/4	4 1/4	2 3/4
67F	67	67	4 1/4	4 1/4	2 3/4
67H	6733	67	4 1/4	4 1/4	2 3/4
67L	67	67	4 1/4	4 1/4	2 3/4
68Q	68	68	4 1/4	4 1/4	2 3/4
68P	68	68	4 1/4	4 1/4	2 3/4
70A	7040	70*	4 1/4	4 1/4	2 3/4
70B	70	70	4 1/4	4 1/4	2 3/4
70D	70	70	4 1/4	4 1/4	2 3/4
70H	7033	70	4 1/4	4 1/4	2 3/4
70ra	7020	70†	4 1/4	4 1/4	2 3/4
70rb	7030	70†	4 1/4	4 1/4	2 3/4
71C	71	71	4 1/4	4 1/4	2 3/4
72K	72	72	4 1/4	4 1/4	2 3/4
72N	7250	72	4 1/4	4 1/4	2 3/4
75A	7540	75*	4 1/4	4 1/4	2 3/4
75B	7523	75	5	5	2 3/4
75C	75	75	4 3/4	4 3/4	2 3/4
75D	7550	75	4 3/4	4 3/4	2 3/4
75E	75	75	4 3/4	4 3/4	2 3/4
75K	7522	75	5	5	2 3/4
76L	76	76	5	5	2 3/4
76M	76	76	5	5	2 3/4
77M	77	77	5	5	2 3/4
78N	78	78	5	5	2 3/4
80A	8040	80*	5	5	2 3/4
80B	80	80	5	5	2 3/4
80C	80	80	5	5	2 3/4
80F	80	80	5	5	2 3/4
80K	8022	80	5	5 1/8	2 3/4
80M	80	80	5	5	2 3/4
80ra	8020	80†	4 3/8	5 1/8	2 3/4
80rb	8030	80†	4 1/4	5 1/8	2 3/4
85A	8540	85*	5 1/4	5 1/4	2 3/4
85D	8550	85	5 1/4	5 1/4	2 3/4
85H	8533	85	5	5	2 3/4
85M	8553	85	5	5	2 3/4
85N	85	85	5 1/4	5 1/4	2 3/4
85pa	8531	85	4 3/8	5 1/8	2 3/4
85R	8520	85	4 3/8	5 1/8	2 3/4
90A	9040	90*	5 3/8	5 3/8	2 3/4
90G	9034	90	5	5 3/8	2 3/4
90ra	9020	90†	5 1/8	5 3/8	2 3/4
90rb	9030	90†	4 3/4	5 3/8	2 3/4
90S	9023	90	5 3/8	5 3/8	2 3/4
90X	9021	90	5 3/8	5 3/8	2 3/4
95A	9540	95*	5 3/8	5 3/8	2 3/4
100A	10040	100*	5 3/8	5 3/8	2 3/4
100H	100	100	5 3/8	5 3/8	2 3/4
100K	10022	100	5 3/8	5 3/8	2 3/4
100N	10034	100	5 3/8	5 3/8	2 3/4
100pr	10032	100	5	5 3/8	2 3/4
100pa	10031	100	5	5 3/8	2 3/4
100ra	10020	100†	5 3/8	5 3/8	2 3/4
100rb	10030	100†	5 3/8	5 3/8	2 3/4
110A	110*	110*	6 1/2	6 1/2	2 3/4

### Pennsylvania Steel Company

Section No.	Wt. Rail	Base Inches	Height Inches	Tread Inches
6	60	4 1/4	4 1/4	2 3/4
244	60*	4 1/4	4 1/4	2 3/4
71	60†	4 1/4	4 1/4	2 3/4
166	61	4 1/4	4 1/4	2 3/4
236	65*	4 1/4	4 1/4	2 3/4
117	65	4 1/4	5	2 3/4
145	66	4 1/4	4 1/4	2 3/4
112	66	4 1/4	4 1/4	2 3/4
2	67	4 1/4	4 1/4	2 3/4
62	68	4 1/4	4 1/4	2 3/4
68	68†	4 1/4	4 1/4	2 3/4
113	70	4 1/4	4 1/4	2 3/4
57	70	4 1/4	4 1/4	2 3/4
46	70	4 1/4	4 1/4	2 3/4
97	70*	4 1/4	4 1/4	2 3/4
237	70*	4 1/4	4 1/4	2 3/4
146	74	4 1/4	4 1/4	2 3/4
87	75	4 1/4	4 1/4	2 3/4
289	75	4 1/4	4 1/4	2 3/4
128	75	5	5	2 3/4
92	75	5	5	2 3/4
249	75	5	5	2 3/4
221	75	5	5	2 3/4
214	75*	4 1/4	4 1/4	2 3/4
248	75	4 1/4	4 1/4	2 3/4
216	76	5	4 3/4	2 3/4
98	78	5	4 3/4	2 3/4
76	79	4 3/4	4 3/4	2 3/4
220	80	5	5 1/8	2 3/4
171	80†	4 1/4	4 1/4	2 3/4
114	80	5	5	2 3/4
78	80	5	5	2 3/4
169	80†	4 3/8	5 1/8	2 3/4
251	80*	5	5	2 3/4
119	83†	5	5	2 3/4
67	85	5	5	2 3/4
156	85	4 3/8	5 1/8	2 3/4
261	85	5	5 1/8	2 3/4
172	85	4 3/8	5 1/8	2 3/4
67-A	85	4 3/8	5 1/8	2 3/4
235	85*	4 3/8	5 1/8	2 3/4
111	85	4 3/8	5 1/8	2 3/4
77	90	5	5	2 3/4
160	90	5	5 3/8	2 3/4
173	90	5	5 3/8	2 3/4
162	90†	4 3/8	5 1/8	2 3/4
170	90†	5 1/8	5 3/8	2 3/4
245	90*	5 3/8	5 3/8	2 3/4
147	95	5 1/8	5 3/8	3
96	100	5 1/8	5 3/8	2 3/4
100	100	5 1/8	6	2 3/4
96-A	100	5	5 1/8	2 3/4
165	100	5 3/8	5 3/8	2 3/4
116	100	5 3/8	6	3
163	100†	5 1/8	6	2 3/4
247	100*	5 3/8	5 3/8	2 3/4
161	100†	5 3/8	5 3/8	2 3/4
299	101	5 3/8	5 3/8	2 3/4
290	135	6	6 1/2	3 3/4

### Bethlehem Steel Company

Section No.	Wt. Rail	Base Inches	Height Inches	Tread Inches
65A	65*	4 1/4	4 1/4	2 3/4
70A	70*	4 1/4	4 1/4	2 3/4
75B	75	5	4 1/4	2 3/4
75C	75	5	5	2 3/4
75D	75	5	5	2 3/4
75A	75*	4 1/4	4 1/4	2 3/4
75E	75	5	5	2 3/4
80A	80*	5	5	2 3/4
85E	85	5	5 1/4	2 3/4
85D	85	5.18	5.18	2.635
85B	85†	4 1/4	5 3/8	2 3/4
85A	85*	5 1/4	5 1/4	2 3/4
90E	90	5	5	2 3/4
90D	90†	5 1/8	5 3/8	2 3/4
90C	90†	4 1/4	5 1/4	2 3/4
90B	90	5	5 3/8	2 3/4
90A	90*	5 3/8	5 3/8	2 3/4
95A	95*	5 3/8	5 3/8	2 3/4
100G	100†	5 3/8	5 3/8	2 3/4
100F	100†	5 3/8	6	2 3/4
100E	100	5 3/8	5 3/8	2 3/4
100D	100	5	5 1/4	2 3/4
100C	100	5 1/4	6	2 3/4
100B	100	5 1/4	6	2 3/4
100A	100*	5 3/8	5 3/8	2 3/4
101H	101	5 3/8	5 3/8	2 3/4
105B	105	5 1/2	6	3
110B	110	5 1/2	6	2 3/4

\*Indicates ASCE section rails.

†Indicates ARA series A section rails.

‡Indicates ARA series B section rails.

### Illinois Steel Company

Sec. Nos.		Wt. Rail	Base Inches	Height Inches	Tread Inches
Old	New				
6001	6051	60	4 1/4	4 1/4	2 3/4
6007	.....	60	4 1/4	4 1/4	2 3/4
6008	.....	60	4 1/4	4 1/4	2 3/4
6009	.....	60	4 1/4	4 1/4	2 3/4
6012	.....	60	4 1/4	5 3/4	2 3/4
6013	.....	60	4 1/4	4 1/4	2 3/4
6014	.....	60	4 1/4	4 1/4	2 3/4
6015	6040	60*	4 1/4	4 1/4	2 3/4
6017	6033	60	4 1/4	4 1/4	2 3/4
6020	.....	60†	4	4 1/2	2 1/4
6030	.....	60†	3 1/4	4 1/4	2 1/4
6101	.....	61	4 1/4	4 1/4	2 3/4
6301	.....	63	4 1/4	4 1/4	2 3/4
6501	.....	65	4 1/4	4 3/8	2 3/4
6503	.....	65	4 1/4	4 3/8	2 3/4
6504	.....	65	4 1/2	4 1/2	2 3/4
6506	.....	65	4 1/2	4 1/2	2 3/4
6507	6540	65*	4 1/4	4 1/4	2 3/4
6508	.....	65	4 1/2	4 1/2	2 3/4
6601	.....	66	4 1/4	4 1/4	2 3/4
6602	.....	66	4 1/4	4 1/4	2 3/4
6603	.....	66	4 1/4	4 1 1/8	2 3/4
6701	.....	67	4 1/2	4 1/2	2 1 1/8
6702	.....	67	4 1/2	4 1/2	2 1 1/8
6703	.....	67	4 1/2	4 1/2	2 1 1/8
6704	.....	67	4 1/2	4 1/2	2 1 1/8
6705	.....	67	4 1/2	4 1/2	2 1 1/8
6706	6733	67	4 1/2	4 1/2	2 1 1/8
6801	.....	68	4 1/2	4 3/4	2 1 1/8
7002	.....	70	4	4 1/2	2 3/8
7003	.....	70	4 1/2	4 1/2	2 1/4
7005	7033	70	4 1/2	4 1/2	2 1/4
7006	.....	70	4 3/4	4 3/4	2 1 1/8
7007	.....	70	4 3/4	4 3/4	2 1 1/8
7008	.....	70	4 3/4	4 3/4	2 1 1/8
7009	.....	70	4 3/4	4 3/8	2 1 1/8
7010	7040	70*	4 3/4	4 3/8	2 1 1/8
7011	.....	70	5 1/2	7	2 3/8
7013	.....	70	4 3/8	4 3/8	2 1 1/8
7014	.....	70	4 3/8	4 3/8	2 1 1/8
7020	.....	70†	4 1/4	4 3/4	2 1 1/8
7030	.....	70†	4 1/4	4 1 1/8	2 1 1/8
7101	.....	71	4 1/4	4 3/4	2 1 1/8
7102	.....	71	5 1/2	4 3/4	2 1 1/8
7103	.....	71	4 3/8	4 3/8	2 1 1/8
720	7250	72	4 3/4	4 3/4	2 1 1/8
7202	.....	72	4 3/4	4 3/4	2 1 1/8
7203	.....	72	5	6	2 1 1/8
7204	.....	72	4 1/4	4 1 1/8	2 1 1/8
7301	.....	73	4 1 1/8	4 1 1/8	2 1 1/8
7502	.....	75	4 3/4	4 3/8	2 1 1/8
7503	.....	75	4 3/4	4 3/8	2 1 1/8
7505	.....	75	4 3/4	4 3/4	2 1 1/8
7506	7540	75*	4 1 1/8	4 1 1/8	2 1 1/8
7507	.....	75	4 3/4	5	2 1 1/8
7508	.....	75	5 57	7	2 1 1/8
7509	.....	75	5	5	2 1 1/8
7512	7550	75	4 3/4	4 3/4	2 1 1/8
7513	7523	75	5	5	2 1 1/8
7514	.....	75	4 3/4	4 3/4	2 1 1/8
7524	.....	75	4 1 1/8	4 1 1/8	2 1 1/8
77501	.....	77 1/2	5	5 1/2	2 3/8
7801	.....	78	5	4 3/4	2 3/8
8001	.....	80	5	5	2 1 1/8
8002	.....	80	5	5	2 1 1/8
8003	.....	80	4 1/2	5	2 1 1/8
8004	8040	80*	5	5	2 1 1/8
8005	.....	80	5	5	2 1 1/8
8008	8022	80	5	5 1/2	2 1 1/8
8009	.....	80	5	5	2 1 1/8
8010	.....	80	5	5	2 1 1/8
8020	.....	80†	4 3/4	5 1/4	2 1 1/8
8030	.....	80†	4 1 1/8	4 1 1/8	2 1 1/8
8501	.....	85	4 3/4	5	2 3/4
8502	.....	85	5	5 1/4	2 3/4
8503	8533	85	5	5	2 3/4
8504	8540	85*	5 1/4	5 1/4	2 3/4
8506	8543	85	5 1/4	5 1/4	2 3/4
8507	8550	85	5 1/4	5 1/4	2 3/4
8509	8553	85	5	5	2 3/4
8520	.....	85	4 1/2	5 3/8	2 1 1/8
8521	.....	85	4 1/2	5 3/8	2 1 1/8
8524	.....	85	5	5 1/4	2 1 1/8
8530	8531	85	4 3/4	5 3/8	2 1 1/8
9001	.....	90	5	5	2 3/8
9002	9040	90*	5 3/4	5 3/4	2 3/8
9003	9023	90	5 3/4	5 3/4	2 3/8
9010	9034	90	5	5 3/4	2 3/8
9020	.....	90†	5 1/4	5 3/8	2 3/8
9021	.....	90	5 1/4	5 3/8	2 3/8
9030	.....	90†	5 1/4	5 1/4	2 3/8
9501	9540	95*	5 1 1/8	5 1 1/8	2 3/8
10001	10040	100*	5 1/2	5 1/2	2 3/4
10002	.....	100	5 1/2	5 1/2	2 1 1/8
10003	10022	100	5 1/2	6	3
10004	10034	100	5 1/2	6	2 3/4
10005	.....	100	5 1/4	5 3/4	2 3/4
10020	.....	100†	5 1/2	6	2 3/4
10030	.....	100†	5 1/4	5 1 1/8	2 3/4
10031	.....	100	5	5 1/4	2 1 1/8
10035	.....	100	5 1/4	5 1 1/8	2 1 1/8
10133	.....	101	5 1/2	5 1 1/8	2 1 1/8
11001	11040	110*	6 1/2	6 1/2	2 3/4



by hand at least once near the end of the rail, so that it will be near the joints.

*Illinois Steel Company (South Works).*—There may be from one to five figures in the heat number, which is stamped at least twice on the unbranded side of the rail. The rail letter is stamped on by the same machine as is the heat number, and it will, therefore, appear as often as the heat number and following it, as 20967A. The distance between the last figure of the heat number and the letter, may be the means of distinguishing what the proper letter is, as this distance increases regularly for each succeeding letter, for example: 16897 C, and 16897 G.

*Illinois Steel Company (Gary Works).*—There are always five figures in the heat number. In other respects the stamping is identical with that at South Works.

*Lackawanna Steel Company.*—There may be from one to five figures in the heat number, which is stamped at least once on the unbranded side of the rail. The rail letter is stamped on by a separate machine at least twice, generally appearing near the heat number.

*Lorain Steel Company.*—There are always four figures in the heat number, which is stamped by hand near one end of the rail, just so that it will not be covered by the joints. Unless specially provided for, rail letters are not stamped on rails made at this mill.

*Maryland Steel Company.*—Bessemer heat numbers may contain from one to five figures and open hearth heats always contain four figures. These numbers are stamped at least twice on the unbranded side of the rail. They should not be confused with a character, which may show immediately in front of the real heat number. The rail letter immediately follows the last figure of the heat number, being added by the same machine. Typical stamping is 4167D.

*Monterey Iron & Steel Company.*—There are always four figures in the heat number, which is stamped at least three times on the unbranded side of the rail. The rail letter is stamped on by the same machine and immediately follows the last figure of the heat number.

*Pennsylvania Steel Company.*—There are either four or five figures in the heat number, which is stamped on the branded side of the rail at least twice. The branding and stamping may come together and cause some confusion. The rail letter is stamped on by a different machine at least once, generally near the center of the rail.

*Tennessee Coal, Iron & Railroad Company.*—There are always five figures in the heat number, which is stamped on the unbranded side of the rail at least twice. The rail letter is stamped on by the same machine, but appears in front of the heat number, i. e., just opposite to the practice employed at the South Works of the Illinois Steel Company.

## ABSTRACT OF ENGINEERING ARTICLES SINCE NOVEMBER 21, 1913.

The following articles of special interest to engineers and maintenance of way men, and to which readers of this section may wish to refer, have appeared in the *Railway Age Gazette* since November 21, 1913:

*New Line Over Wasatch Mountains, Utah.*—The D. & R. G. has just completed the building of a 2 per cent. line 15 miles long on the west slope of the Wasatch mountains replacing a line with a maximum grade of 4 per cent. to effect important operating economies. A complete discussion of the operating conditions on the old and new lines, the previous economies that have been made possible by the use of Mallet locomotives and the location and construction of the new line was published in the issue of November 28, page 1013.

An editorial comment on the positions now open to railway engineers on the valuation of railway property that is being undertaken by the government, was published in the issue of December 5, page 1053.

*Summit-Hallstead Cut-off of the D. L. & W.*—The second article on this cut-off, describing the interesting features of the construction of the bridges on the line up to the present time was published in the issue of December 5, page 1069. The article deals largely with the Tunkhannock

viaduct, a reinforced concrete arch structure 2,375 ft. long, which will be the largest bridge of its type in the world.

*Future Development of the Chicago Terminals.*—An abstract of the report presented by Bion J. Arnold to a committee of citizens of Chicago, reviewing the report of John F. Wallace and outlining comprehensive recommendations for a reorganization of the railway terminals in the city, was published in the issue of December 5, page 1078.

*Seams in Rails.*—The general conclusions reached by H. B. McFarland, engineer of tests of the Santa Fe, and M. H. Wickhorst, engineer of tests of the Rail Committee of the American Railway Engineering Association, on the effects of seams in the base of rails as contained in Bulletin No. 160 of that association, were published in the issue of December 5, page 1082.

An editorial comment on the inauguration of an exhaustive study by a joint committee of the American Railway Engineering Association and the American Society of Civil Engineers on the stresses to which a rail in track is subjected was published in the issue of December 12, page 1108.

*Grade Separation Laws and Requirements.*—A full discussion of the state laws and municipal requirements for the elimination of grade crossings of railways and highways including an abstract of 27 state laws and an inset covering the cities in which the largest amounts of this class of work have been done, was published in the issue of December 12, page 1118. An editorial on the same subject was published in this issue, page 1109.

## ECONOMY IN CUTTING RAILS.

By C. L. VAN AUKEN.

For some time past the railways have been trying to instill in employees a spirit of economy in the use of materials and supplies. Our best track men have always been trained along these lines. Doubtless, however, some ideas with regard to the economical use of rails in construction will be of interest to some men who have not had extensive experience in construction.

Some rules are so simple that they are almost axioms, and one of these is: always cut a piece of rail from the shortest available rail from which a piece of the desired length can be obtained; or cut the short piece from a rail with a bad end or an undrilled end. This rule is frequently violated, in spite of its simplicity, and the number of feet of rail scrapped is therefore greater than necessary. The cost of a 100 lb. rail is in the neighborhood of 50 cents per foot, so it is easily seen that some extra attention resulting in the saving of several feet of rail per day may pay the foreman's wages.

Wherever it is necessary to cut a new rail for some purpose where the permissible length of the piece may vary several feet, it is usually advisable to cut the rail in two in the middle, making two 16½ ft. pieces; as the other short rail can then generally be used to advantage. Such a case may occur when locating a switch where the location may be varied several feet without objection.

There are at least five places where, by careful planning, a saving in rail can be effected; (1) where a change is made from square to broken joints on curves; (2) when moving rails to make joints clear a switch rail; (3) where the switch lead necessitates a cut piece about one-half a standard rail length; (4) when putting in a frog, and (5) when putting in a stock rail.

When running into a curve on a track laid with square joints, the rail should be cut as follows: Compute the difference in lengths of the outside and inside rails, then cut a standard length rail into two parts, one shorter than the other by an amount equal to the difference in length of the outer and inner rails. By placing the short piece on the inside rail at the point of curve, and the long piece on the outside of the curve, the joints will be square again at the end of the curve. The difference in length of the inner and outer rails is equal to 1 1/16 in. per degree of curvature for each 100 ft. in the curve.

When moving rails to clear the position to be occupied by a switch rail, a standard length rail should be cut in two at a point such that one piece put in back of the rails in the switch will throw the joints in correct position, and then the opposite

piece will just close up the track at the opposite end of the switch.

When putting in a No. 7 switch, for instance, where a 30 ft. and a 15 ft. rail make a satisfactory length of lead, the two short lead rails, of course, should be cut from 30 ft. rails, thus leaving no waste. In such a case the rail should be cut 14 ft. 10½ in., and 15 ft. 1½ in., the short piece to be used on the straight rail and the long piece on the curved rail. This will square the switch points up nicely.

Wherever possible, a frog should be located so that it, together with the connection rail behind, will be the same length as a standard rail. Then, if the frog is ever taken out, a standard length rail, without cutting, will serve to make the connection.

Stock rails in permanent switches should always be full standard length rails. They wear out faster than ordinary rails, and if they are not of standard length, a rail must be cut each time the stock rail is renewed.

The last two are not cases where a saving is effected during construction, but rather in maintenance. The effect on cost of maintenance and renewal is a feature that should receive more attention.

In the above it has been assumed that a proper method is used in cutting the rail. A poor cut is more damaging than the violation of almost any of the rules mentioned above, as it wastes time and spoils the entire rail, as far as that particular length of rail is concerned.

One of the most essential points in cutting a rail is to have the chisel cuts or marks in the same plane on both sides of the base and web. The chisel cut should be squarely at right angles to the rail, and the chisel should be sharp. No matter how deep a cut is made, difficulty is usually experienced in breaking a rail squarely, which has been cut or rather dented by a dull chisel. The chisel should be struck light square blows with the spike maul, and special caution is necessary when using a new chisel or one with a new edge.

In the oldest method of breaking a rail, the idea prevailed that the depth of cut had considerable effect on the ease of breaking, and the rail was chisel marked all the way around—both sides of the base, both sides of the web, and the top, sides and under portion of the ball. That this idea is erroneous is shown by methods now in use. It was also customary to drop the rail across a "dutchman," or short rail, to break it. This method is not as reliable as others, and, of course, is contrary to "safety first" principles.

A rail may be broken very satisfactorily as follows: Chisel mark both sides of the base and web; place the rail on one side with the ends on blocks; instruct three or four laborers to stand on the rail near the center; place the chisel edge (use a dull chisel) on the web as close to the base as possible, and strike it one or more heavy blows with the spike maul. One blow will be enough in nearly every case. Examine the chisel cut on the part of the flange turned down, and if it is cracked, turn the rail on the opposite side and repeat the process. Then turn the rail workways, have a number of men stand on it, and then have one man jump on it, which nearly always breaks it. If the rail does not break, place the chisel edge *directly* above the chisel cut, and strike it one heavy blow (or more if necessary) with the maul. The face of the ball of the rail, cut in this manner, will present a surface as smooth as that produced by a hack saw.

A second method, for making a quick cut, is to chisel cut the upper side of the flange on one side only. Then turn the rail on its side on the track ties, cut down with the ends on blocks and have three or four laborers with bars press down heavily on the center of the rail, obtaining leverage under the ball of the track rail. Then crack the rail, using the same process as in the first method.

Another method which it is claimed will always break a rail, using only six or seven blows of the hammer, is to lay the rail on its side and cut the edge of the flange with a chisel, striking

three heavy blows. Then turn the rail on the opposite side, with the ends on blocks, and strike one heavy blow. Turn the rail back on the opposite side and strike one heavy blow with hammer. Again turn the rail workways and one blow on ball will break it.

The writer has never seen the last method tried, but has seen the second method used successfully with just two experienced men, handling full length rails, without any assistance whatever. The third method is successful and very rapid, and is therefore especially efficient where a cut has to be made in three to five minutes.

## ANNUAL TRACK INSPECTION ON THE N. Y. C. & H. R.

The report of the annual track inspection of the N. Y. C. & H. R. for 1913 has just been issued. This report shows that subdivision 23 of the Western division, A. M. Clough, supervisor, received the rating of 83.4, the highest of any subdivision on the main line between New York and Buffalo, with subdivision B of the electric division, C. J. Redifer, a close second with a rating of 83.3. The highest rating of an individual section was 85.4, on section 6 of subdivision B of the Electric division, Joe Masulla, foreman. The next highest rating of 84.5 was awarded to section 8, subdivision A, Electric division, Pietro Matzell; to section 7, subdivision 5 of the Mohawk division, Joseph Harris, foreman, and also to section 4, subdivision 12 of the Rochester division, Adelbert Foster, foreman.

No premiums are awarded to supervisors. The foreman receiving the highest rating on each main line subdivision receives a premium of \$3 per month, while the foreman having the best section on each division except on the electric division, receives an additional premium of \$2 per month. In addition, eight foremen having the best section on their respective groups of branch line subdivisions receive a prize of \$2 per month, while 10 yard foremen receive prizes of \$3 per month. As the object of the premium system is to reward foremen for their individual efforts during the year rather than the appearance of their sections on the day of inspection, nine sections receiving high marks were restricted from the premium list because of extra gang work or change of foremen.

## PROVIDING ORDINARY COMFORTS FOR THE SECTION FOREMAN.

By GEORGE S. CRITES,

Assistant Engineer, Southern Pacific, Benson, Ariz.

Railroads in general concede that the personnel of their track foremen has been deteriorating during the last two decades. The reason oftenest heard for this falling off in the reliability, integrity, and general responsibility of the foremen is the predominating scarcity of labor throughout the industrial field and the poorer mental, moral and physical standards of our immigrants from which the track forces are recruited. It is said with truth, that lucrative employment in agriculture, manufacturing, mining and other industries draw the men from railway track-work, and the railroads are forced to fill up the thinning ranks with the ignorant derelict foreigner.

If the standards of section foremen's positions can be raised the calling will be more esteemed. The management of the Southern Pacific has done much towards this end. They have long stretches of track extending through inhospitable arid regions. At intervals are the section headquarters. Neat "adobe" or more recently tile bunk houses are furnished for the laborers, the latter now being standard for the desert country. These have a tendency to keep the laborer contented, as he is well and comfortably housed, and a contented gang has much to do towards keeping the foreman in the same mood.

The standard section foreman's house is complete and up-to-



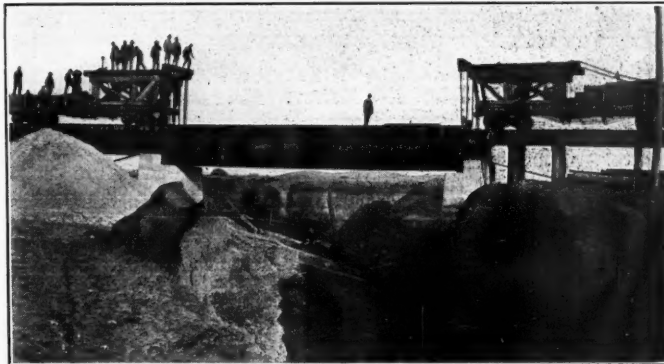
date in every particular. The same house in a town would rent for from \$18 to \$30 per month, unfurnished, and it usually is by far the best appearing residence in its immediate community. It is a fine thing for the housewife to be able to be proud of her home, and a proud and home respecting wife goes a long way toward putting the same qualities into her husband.

Great pains are taken in planting and keeping suitable shade trees around the section headquarters. The company has plant nurseries at convenient locations, and from these young trees are sent to foremen in order that the grounds around the section headquarters may be made homelike and provide adequate shade. One of the nurseries is the hobby of a roadmaster who has been with the company for 35 years; during 33 of which he has held the position of roadmaster. He has been known to spend an entire day looking through the country for a certain species of tree that he knew would do well in some locality where former tree-planting experiments had not been successful. It is to be remembered that water has to be hauled in tank cars, in some instances many miles, to irrigate the trees in certain locations. In these places a tree would only last a few days without this water. The management is willing to do this for their trackmen's comfort, for a foreman who is willing and wants to have a pleasant appearing headquarters is very apt to take a pride in his work. In passing it might be said that many foremen have complete and useful truck gardens in their yards. Some of these are kept growing with water hauled in tank cars.

Another item that is not overlooked is the pure and wholesome supply of domestic water. This water is hauled from the nearest station, furnishing water not impregnated with salts, in clean steel tank cars set aside especially for this service. At the section quarters it is run into brick or cement cisterns built

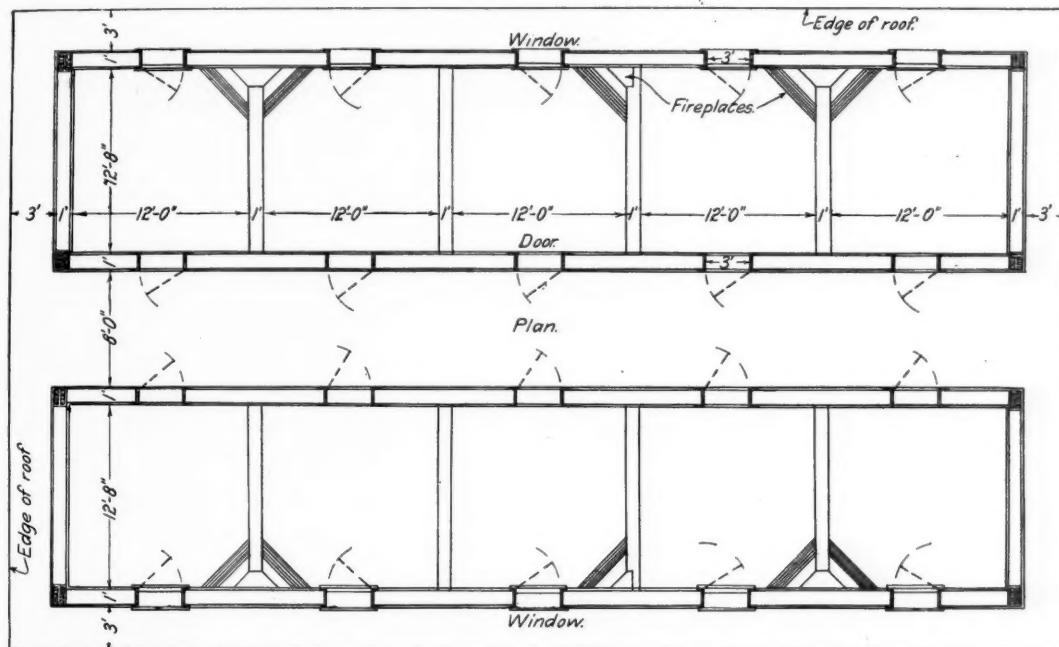
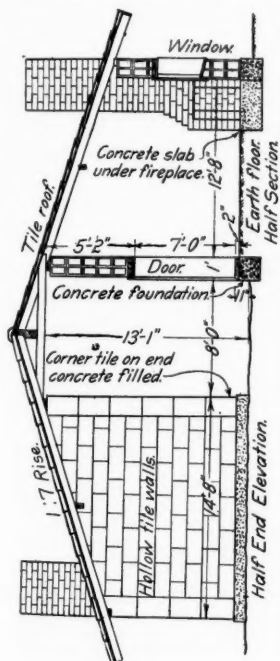
## ECONOMICAL BRIDGE ERECTION.

The E. P. & S. W. recently placed two 40-ft. and one 60-ft. deck plate girders across an opening one mile east of Carrizozo, N. Mex., in an economical manner. These girders were riveted up and ties placed on them at the station. They were then swung in between two flat cars and moved to the bridge by a switch engine, the falsework was dropped into the creek bed and the girders were lowered into position. The expense of



Girder Loaded Into Position.

fitting up the two flat cars, as shown in the accompanying photograph, without including ropes and blocks, was \$180, and the labor expense for loading and placing the three girders was \$120, making a total of \$300. The time consumed in placing the 60-ft. girder from the time it arrived at the bridge until it was placed in position and the track restored to traffic was one



Plan and Elevation of Ten-Room Tile Bunk House for Section Laborers.

underground. In these it keeps fresh and reasonably cool during the hottest summer months. Ice is furnished in the warm localities from early in the summer months until late in the season. Each section gang through these stretches receives between 25 and 50 lbs. of ice daily. This service costs the company in the neighborhood of \$5 per gang per month.

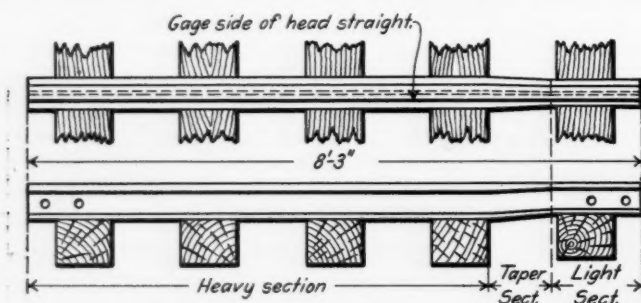
Motor cars are now made standard section equipment and are replacing the old hand cars as fast as the latter wear out, and it has been decided that the motor car will not be used for lengthening out the sections. The time and energy saved by their use is being expended on sections of the old lengths, thus giving a higher standard of maintenance.

hour 40 minutes. The last 40-ft. girder was placed in one hour 20 minutes. The accompanying photograph was taken just after the girders had been lowered to the piers and shows the falsework in the bottom of the gulch as well as the frames on the cars for handling the girders. We are indebted to F. M. Clough, general foreman of bridges and buildings, E. P. & S. W., for the above information.

RAILWAYS OF NEW ZEALAND.—Except for 29 miles of private lines, the railways of New Zealand are in the hands of the government, which now owns and operates 2,860 miles of 3 ft. 6 in. gage line.

### A TAPER RAIL.

Instead of the compromise or step joints commonly used between rails of different sections, the Harriman lines have used for a number of years, a taper rail, as shown in the accompanying drawing. This rail is drawn down from one section to another in the space between two ties or about 10 in. to allow an



Plan of Taper Rail Used on Harriman Lines.

even bearing on all ties and to permit the use of standard fastenings at the joints. There is also no sudden offset in the width of the head of the rail, as with the compromise joints to catch a wheel flange, but the change in the width of head of the rail is gradual.

### THE FULTON POCKET TARGET.

The Fulton pocket target is a convenient article for assisting in locating or sighting the line from which a plumb bob is suspended over a given point. It is made of white celluloid and is circular in form with a diamond-shaped opening in the center which offers contrast against the white body of the target so that the plumb line may be more readily seen from an instrument. This target is  $2\frac{1}{2}$  in. in diameter, can be conveniently carried in a pocket and can be readily attached and raised or lowered by means of the slots. This target is made by Kolesch & Company, 138 Fulton street, New York.



Fulton Pocket Target.

when one knows that all these roads were directly responsible to and under the immediate control of one authority.

UNIFORM RAILWAY ACCOUNTS IN CHINA.—The Chinese railway authorities are now engaged in establishing a uniform system of railway accounts. That there is need of this is indicated by the fact that some of the former accounts were but cash books of a most elementary nature, which could hardly be called accounts, from the railway point of view. The accounts of each road not only were different from those of the other roads, but sometimes changed from year to year. Worse still, there appeared to be much useless duplication. Oftentimes one found a complete set of accounts in the Chinese language, rendered in the old fashioned manner, accompanied by another complete set of the same thing in some foreign language—English, German, French or Japanese. This lack of uniformity becomes all the more striking

### THE ABSOLUTE LOCK NUT.

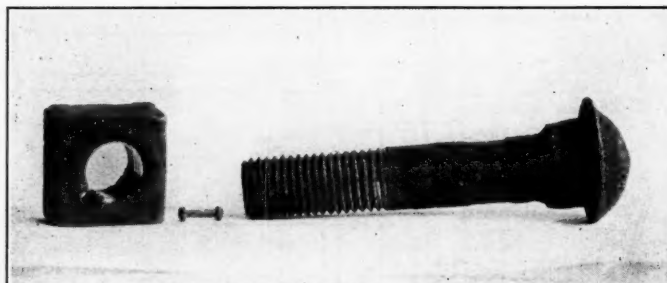
The Absolute lock nut consists of a slotted recess cut in the inner surface of an ordinary nut and provided with a locking pin which travels in this recess. The recess is beveled so that one end is deep enough to allow the pin to clear the threads of the bolt; the other is shallow enough to force the pin into binding contact with the threads, and the angle is such that the pin is automatically wedged against the threads when the nut is reversed. Any forward motion of the nut throws the pin into the deep end of the recess allowing it to be turned freely, but a reversal throws the pin into the shallow end and immediately locks the nut. The heads of the locking pin are



Absolute Lock Nuts on an Illinois Northern Crossing.

so shaped as to form a continuation of the thread of the nut and when the nut is being turned on the bolt these heads of the locking pin travel in the threads of the bolt.

In applying the nut, it is first screwed onto the bolt about two threads and the pin is inserted when the slot is down. When the heads of the pin are lined up with the threads of the nut the finger is placed inside the nut over the pin to hold the latter in place through a half turn of the nut. In this position the inner head of the pin will be engaged in the thread of the bolt, which obviates the necessity of holding it any longer. The nut can then be tightened to the desired position with a wrench. To remove the nut a nail or brad of convenient size is inserted in the shallow end of the recess, holding the locking



Bolt and Nut Removed from Chicago & Alton Track After Three Years' Service

pin in the deep portion and thus permitting the nut to be turned in the reverse direction.

This lock nut has been in successful use on a large number of roads and for as long periods as three years. The earliest installation, which was made on the Chicago & Alton at Joliet in February, 1910, is still reported to be giving good satisfaction. A photograph of one of the nuts in this installation which was recently removed is reproduced herewith. The American Lock Nut Company, Chicago, owners of the patent and manufacturers of the nut, have until recently operated a small plant in Porter, Ind. The demand for the nuts has so increased, however, that a new factory has been equipped in Pullman, Ill., which has a capacity of 150,000 nuts per day.

AN ALL-STEEL PASSENGER CAR IN INDIA.—The South Indian Railway has recently put in service the first all-steel passenger coach built for service in the tropics.



## General News.

It is announced in Washington that beginning January 1 the Postoffice will abandon the practice of sending periodicals by freight trains.

The Baltimore & Ohio has discharged or suspended a large number of employees in its shops and considerable numbers elsewhere.

The Lake Shore & Michigan Southern has laid off 900 men at its Collinwood shops.

The Chicago, Milwaukee & St. Paul has placed the blacksmith and boiler departments of its West Milwaukee shops on a basis of five days a week.

After about six months of negotiations the Chicago & Alton has awarded an increase of pay of one cent an hour to its shop employees at Bloomington, Ill.

The Legislature of New York has passed a law making elaborate provisions for compensation for injuries and deaths of employees engaged in hazardous occupations.

Reductions have been made in the forces in the shops of the Southern Pacific Company in California; the reduction, in most cases, being a very small percentage of the total force.

The state sanitary inspector and pure food commissioner of Idaho has prohibited the use of finger bowls in cafes, hotels and dining cars, as unsanitary. The dining car department of the Northern Pacific discontinued the use of finger bowls over three months ago.

An officer of the Western Pacific reports that along the line of that road from Oroville, Cal., to Gerlach, Nev., 233 miles, three or four thousand unemployed men have camped out nightly during the past month. It is said that large numbers of these men are members of the "Industrial Workers of the World."

Hon. Charles A. Prouty, of the Interstate Commerce Commission, will address the Dartmouth College Alumni Association of Chicago at its annual dinner at the University Club on January 17. He will speak on the work of making a valuation of railway property. Mr. Prouty graduated from Dartmouth in 1875.

At the Pennsylvania station in Philadelphia last Sunday 39 passengers, in the smoking car of a train from the West, were forced by the health authorities to submit to being vaccinated, a passenger having been found in the car who was suffering from virulent smallpox. Two of the passengers resisted the efforts of the health officers for ten hours.

The latest information from Washington is that President Wilson will reappoint Interstate Commerce Commissioner Clements on January 1 and later will appoint a western man in place of the late Commissioner Marble. The president is expected to take no action on Commissioner Prouty's resignation until the freight rate question presented by the Eastern roads has been disposed of.

At Middletown, Conn., December 12, Arthur L. Bradley, the motorman who was responsible for a collision on the New York, New Haven & Hartford, near Middletown, in October, pleaded guilty to the charge of manslaughter and was sentenced to three months' imprisonment in the county jail. Bradley neglected to stop his car at a station where he should have waited for an opposing train.

L. B. Foley, superintendent of telegraph of the Delaware, Lackawanna & Western, is continuing his experiments with the wireless telegraph between the company's stations at Scranton, Pa., and Binghamton, N. Y., and from these places to moving trains. A severe storm of sleet recently disabled the wires between Scranton and Binghamton, and for two hours the dispatcher sent train orders between these two stations by the wireless telegraph.

Eastbound passenger train No. 16 of the Lake Shore & Michigan Southern was derailed on the morning of December 13, about 1 o'clock, at a point near Wickliffe, Ohio, by the malicious loosening of the rails. The fireman was killed and a mail clerk was injured. A. H. Smith, the newly elected president of the

New York Central Lines was in his business car at the rear of the train. The company offered a reward of \$1,000 for the apprehension of the persons guilty of loosening the spikes and splice bars.

In the December 11 issue of *Leslie's* there is an article by Major John McGaw Woodbury describing in a popular and very readable way some things that have been done by the railroads to promote efficiency. The article in question is entirely non-technical, but Major Woodbury, who was chief surgeon on the staff of Major General James H. Wilson during the war with Spain, and chief surgeon under General Miles in Porto Rico, is an expert on efficiency and his comments are, therefore, of interest to railroad men as well as to the general public.

The valuation committee of the National Association of Railway Commissioners, consisting of three commissioners for each of the five groups into which the country has been divided for the valuation of railway property being made by the Interstate Commerce Commission, held a meeting at Chicago on December 10. The committee agreed on plans for keeping in touch with the progress of the work done by the federal commission by attending meetings and conferences to represent the state commissions and to present any information in their possession.

The Louisville & Nashville, through its counsel, has refused to permit the Interstate Commerce Commission examiners to inspect the file in which is the record of the Louisville & Nashville's relations with the Tennessee Central and other Tennessee roads. Chairman Clark, of the commission, has applied to the Senate, which had instructed the commission to make the investigation, for further instructions. Both the commission and the railroad lawyer declare that the question is of importance because it involves a principle which will be used as a precedent in other cases.

Passenger conductors on the Middle division of the Pennsylvania have been instructed to do everything possible to facilitate delivery of telegrams to passengers on trains. If practicable, the telegraph messenger should be allowed to go through the train; and the messenger is to be aided in finding the passenger, as far as this is possible. Where the messenger cannot have time to go into the train the conductor can receipt for the telegram. If a telegram is not delivered the conductor must have a station agent or an operator return it to the telegraph company with proper notation.

H. E. Byram, vice-president, and Hale Holden, assistant to the president, of the Chicago, Burlington & Quincy, testified on December 15 before the board of arbitration that is hearing evidence in the wage controversy between the Burlington and its trainmen and conductors. To controvert statements made by representatives of the employees that the Burlington's traffic and earnings had increased faster than wages Mr. Byram presented tables showing that while freight train miles had increased from 1902 to 1912 only 29 per cent., the freight train wages had increased 58.25 per cent., and while passenger train miles had increased 22.18 per cent., passenger train wages had increased 74.53 per cent.

Arrangements have been made by the real estate and industrial department of the Chicago, Burlington & Quincy to turn over to farmers under lease at a nominal rental lands on the right of way, on each side of the tracks, to be sowed with alfalfa. John B. Lamson, agriculturist of the road, will negotiate leases for all of the right of way space available for this purpose, at the rate of \$5 for each adjacent farm, and it is estimated that approximately 25,000 acres of land will thus be made available for tillage. It is believed that the alfalfa will eliminate much of the danger of fires from locomotives, that it will present a pleasing appearance to passengers and that it will be of financial benefit to the farmers.

The Western Railway Club, Chicago, on Tuesday evening of this week, listened to an interesting paper by Frank McManamy, chief inspector of locomotive boilers for the Interstate Commerce Commission, on the work of his department. He showed records of a marked decrease in accidents from locomotive boiler failures since the Federal inspection law has been in effect. He also mentioned features of boiler construction in which there has been no appreciable improvement since the government began its inspections, and recommended that the railroads take

concerted action to remedy these defects and deficiencies. The speaker exhibited a number of lantern slides showing the results of locomotive boiler explosions.

A bill has been introduced in the lower House of Congress forbidding common carriers to limit below 90 days the time within which claims for loss and damage of freight or overcharges shall be presented. A bill introduced by Representative Stevens, of New Hampshire, designed to give the Interstate Commerce Commission authority over all matters of transportation on interstate railroads in which a question of safety is involved, confers on the commission extensive powers: "the power, after investigation, notice and hearing, to issue an order or orders, fixing, determining and designating changes, improvements and repairs to be made in the way and structures, the kind of equipment, the standard of equipment and supplies, the installation of signal systems, train control devices, automatic train stops and other safety appliances; operating rules, regulations and methods, train schedules, running time of trains, size of train crews, hours of labor for employees. . . ."

The Delaware, Lackawanna & Western has announced to its officers and employees that any suggestion, recommendation or information tending to improve the safety, efficiency or economy of the company's operations, in any direction whatever, when proffered by an officer or an employee, will be submitted to a committee for criticism; and that any device, practice or measure which such committee may approve as useful for the company will be made the subject of an award of money to the one proposing it, the award to bear a fair relation to the money value which the adoption of the improvement shall prove to be to the company. Where an employee offers a device which he desires to have patented, the company will, if the thing be patentable, secure letters patent at its own expense, for the benefit of the inventor, the inventor agreeing that the company may use the invention on its lines free of royalty. President Truesdale, in a circular congratulating officers and employees on the successful and profitable outcome of the past year's activities, gives detail instructions for the proper procedure. Everything offered must be submitted to the Registrar of Contracts, 90 West street, New York City, and from there every proposition will be sent to the committee without the name of the proposer, this to provide for absolute impartiality. The president will designate the officer or committee to investigate the merits of proposals. The sole purpose of this action by the company is to arouse and utilize the interest of every employee in perfecting the Lackawanna into the most highly efficient transportation machine that it can possibly be made.

#### Train Wrecked by Earthquake.

Near Chemnitz, Germany, on the night of December 15 eight persons were killed and 30 or more injured in a passenger train which was crushed, while passing through a tunnel, by the collapse of the roof of the tunnel, which had been disturbed by a slight earthquake. The locomotive and six cars were buried beneath great rocks.

#### Cab Signals on the London & Southwestern.

The Prentice wireless apparatus for cab signals and automatic train stops, which was tried two years ago on the Canadian Pacific, at Toronto, Ontario, is being installed in connection with four block sections, double track, on the London & Southwestern Railway, England.

#### An Appeal to Parents.

This is the title of a "safety-first" pamphlet which has been issued by the Ohio River & Columbus, and it is being circulated among school teachers with a view to having it put into the hands of children, with the hope that they will spread the gospel to their parents. Charles J. Finger, general manager of the road, in a letter to teachers, asking their assistance, reminds them that they already do for their pupils more than the strict letter of duty requires; and on the strength of this he asks them to assume one more burden which perhaps may be unappreciated. The closing chapter of the pamphlet (the whole pamphlet fills only three pages) is in part as follows:

*Mothers, Fathers, Have You Ever Warned Your Children?* Have you ever forbidden them to be in the neighborhood of the

trains and station? Have you ever impressed upon them the danger that always lurks near a railroad? If not, will you please do so? Sensible people cannot afford to neglect this as a duty, a duty as great as that of warning them against the misuse of fire arms or any other common danger. Forbid them to be around the tracks or station or yards, except business calls them there. Forbid them under any condition to walk the track or play on railroad bridges. Crossing signs, bells, signals, warnings mean very little to a child. Children do not realize that anything can happen to them. . . .

#### "Safety First" on the Pennsylvania.

Superintendent J. B. Baker of the Philadelphia Terminal division of the Pennsylvania has held recently four "safety first" meetings, at which the aggregate attendance was 3,500. These meetings were held at various points on the division at convenient hours to enable both day and night employees to attend.

G. F. Heidelbaugh, general yard master, acted as chairman and short addresses were made by employees from the various departments. One speaker, Pietro Matteo, crossing watchman, delivered his address in his native tongue, Italian. This address will be printed in English and Italian and will be distributed to employees. Safety Inspectors Carrow and Sheedy also made short addresses with illustrations, showing the practices of today. Motion pictures were also shown. The Italians who listened to Mr. Matteo numbered about 430.

#### Safety First on the Northern Pacific.

Charles T. Banks, special representative of the first vice-president of the Northern Pacific, in charge of the bureau of efficiency, has designed some interesting posters which are being used in the Safety First campaign.

A red card about 5 in. by 7 in. on which is printed in black letters, "THERE'S A SAFE WAY TO DO IT. DO IT THAT WAY. START NOW!" has been posted inside and outside of all buildings and shops where men are employed, in the most conspicuous places, passenger station buildings excepted. Seal clerks, yard clerks and other employees who seal cars and tack destination or switch movement cards on cars were given a supply of these safety cards to attach to each car sealed or carded, the purpose being to flood the Northern Pacific buildings and cars with the cards in the shortest possible time, everywhere and anywhere, so that they would be conspicuous to employees.

Two very large notices are also posted on bulletin boards each month. One with a wide red border headed, "INJURY NOTICE," gives the record for the month as to the number of the various classes of employees injured, and continues,

EIGHTY-SEVEN PER CENT. of these injuries could have been avoided if the injured men had DONE THEIR WORK THE WAY THE NORTHERN PACIFIC RAILWAY CO. HAVE REPEATEDLY ASKED THEM TO DO IT; HAD TAKEN NO CHANCES—HAD DONE THE WORK THE SAFE WAY—THE RIGHT WAY.

CARELESSNESS, HASTE, FAILURE TO THINK OF CONSEQUENCES, DOING THINGS "THE OLD WAY" (BULL-HEADEDNESS) ARE THE THINGS RESPONSIBLE FOR THE LARGE PERCENTAGE OF INJURIES THAT OCCUR.

SUPPOSE YOU JOIN THE "CAREFUL CLUB" FOR SIXTY DAYS AND AVOID GETTING KILLED OR INJURED: THIS WOULD SURE MAKE A HIT WITH THE FOLKS AT HOME.

Another with a black border and headed, "DEATH NOTICE" contains the following:

TWO EMPLOYEES VIRTUALLY COMMITTED SUICIDE DURING THE MONTH OF OCTOBER.

One, a shop laborer, on his way home after work, undertook to crawl under a car—taking with him a sack of flour; switch engine moved the car and killed him. He would have been alive today had he taken the time to walk a short distance around the cars.

The other, a car inspector, finished his inspection of a freight train, took down the blue flag and sat down on the track to light his pipe; the road engine backed onto the train, moved the cars back, caught and killed him.

IS THERE ANY WAY THAT THE NORTHERN PACIFIC RAILWAY CAN PREVENT SUCH TERRIBLE DEATHS?

YOU KNOW THE ANSWER.

WHY DON'T YOU CUT OUT ALL OF THESE "FOOL STUNTS" AND STOP MAKING WIDOWS AND ORPHANS OF YOUR FAMILIES? IT'S UP TO YOU.



#### An Unusual Railroad Commissioner.

J. H. Hale, a member of the Connecticut Public Utilities Commission, speaking last week at the meeting of the Massachusetts State Grange in Boston, criticized the forced separation of the New Haven and the Boston & Maine railroads. He said, in part: A great calamity now confronts the leading railroad interests serving this New England agricultural territory. Crushed between professional agitators, financial pirates, labor unions and threatened prosecutions by the government at Washington, these noble truck horses of ours, with greater burdens to carry than ever before, are to be separated in their work, and allowed no extra feed in the way of increased freight rates to make up for the extra strain of an overload of expenses.

"Their side line feeders, the electric railways that pass our farms and are only just beginning to serve us so cheaply and well, are to be cut off. And all for what? Who is to be benefited? Certainly not the stockholders nor train employees; not the traveling public or the receiver or shipper of freight. No one is to be benefited that I can discover, and all are to be injured, except possibly the vultures that pick the remains.

"Probably some of the purchases, mergers and consolidations of the past were technically wrong, too high a price paid for some of them, and those who led in this have paid, or must pay, the penalty. And yet, in spite of all this, the total result was to give all New England better and increased service at no extra cost; and I am clearly of the opinion that a complete separation of all these interests and going back to the old way, as now demanded, will mean turning back the clock of New England's prosperity fully twenty-five years."

#### Seth Low on the Railroad Problem.

Seth Low, of New York City, who was one of the board of arbitrators that recently settled the wages of conductors and trainmen, speaking last week at the annual meeting of the National Civic Federation, of which he is president, expressed the opinion that if the government should decline to allow the increase in freight rates now asked for by the Eastern roads a strong impulse would be given to the demand for public ownership and operation of railroads. Investors everywhere, not merely the bankers, are watching the present situation with a concern out of all proportion to the amount of money involved. To compel increases of expenses and forbid increases of earnings will check the flow of capital into American railroads. "I do not say that the Interstate Commerce Commission is at liberty to disregard the economic aspect of the request for higher freight rates, but in my judgment neither is it at liberty to disregard under existing conditions the psychological importance of the decision."

Mr. Low spoke at length on the dangers and difficulties attendant upon government ownership and operation of railroads. He said that in Germany, France, Australia, Italy and Austria the earnings of state owned roads barely equal or fall below the amount paid in taxation by the roads here. He suggested that the railroads lower their passenger rates. "Our railroad managers, if they would think for a moment as government officials, would realize that passengers vote but freight does not. It is true that every person who consumes anything carried by rail pays theoretically a part of the freight, but the percentage in any given case is almost infinitesimally small and the resultant charge for freight borne by a workingman's family is small beyond recognition compared with the addition of even five cents to the cost of his daily journey to and from work."

#### The Harriman Safety Medal.

At the dinner of the American Museum of Safety in New York City on Friday evening of last week, the E. H. Harriman medal, provided by Mrs. Harriman as a memorial to her late husband, was awarded to the Southern Pacific Company. Professor F. R. Hutton in the presentation speech stated that the Southern Pacific had had no train accident fatal to a passenger during the past five years. Julius Kruttschnitt, chairman of the board of directors of the company, spoke on behalf of the road, and received a replica of the medal, which is to be made of gold.

The *Scientific American* medal was awarded to the Welin Marine Equipment Company for efficient devices for saving life

at sea. The Rathenau medal was awarded to the General Electric Company for progress in the field of electrical invention, and the Travelers Insurance Company medal to the New York Telephone Company as the American employer who has done the most for the protection of employees in life and limb.

Among the speakers at the dinner was Dr. Arthur T. Hadley, president of Yale University, who said in part:

"My direct knowledge of safety appliances dates from the eighties, when I was an editor of the *Railroad Gazette*. Since those days I have been so occupied with preventing educational derailments and collisions that I have had little time to familiarize myself with the new methods of handling railroad traffic.

"At the International Exposition of Safety and Sanitation I was impressed by the enormous advance made in safety devices and the comparatively small advance made in safety itself. Here, as in many other things, we do not utilize the good appliances of today as well as we did the cruder appliances of thirty years ago. The fault, I think, is not so much with the railroads as with the public officials, and perhaps not so much with the public officials as with the general public behind those officials. There is an indiscriminate demand for safety which results in too many appliances and too little system.

"What railroads have been constantly urged to do in recent times is to adopt more than one method of preventing accidents; to insure the safety of the passengers if the engineer disobeys his block signal, or to protect the train behind if the brakeman fails to run back and flag it. This sort of alternative provision for safety may do more harm than good. If a new appliance helps to fix responsibility it is a gain; if it tends to weaken responsibility it is a loss. For the truth must never be forgotten that the all-important thing in safety is discipline.

"We hear talk of eliminating the human factor and making safety arrangements which shall be wholly and entirely automatic. The human factor can never be eliminated."

At the exhibition of safety devices which was the occasion of this dinner displays were made by the Pennsylvania, the New York Central, the Southern Pacific, the Baltimore & Ohio and the Chicago & North Western. The Pennsylvania sent men from its shops to give demonstrations of how to revive a man who has been injured by an electric shock. The New York Central showed a reproduction of its "safety first" car which carries the safety-first lecturers of the company to all parts of its territory. The Baltimore & Ohio exhibited models, drawings and other illustrations showing the great variety of safety-first measures which have been put in effect on the lines and at the shops of that company.

#### A Statement from Mr. Yoakum.

B. F. Yoakum, chairman of the board of directors of the St. Louis & San Francisco, declaring that the criticisms of his participation in the construction of certain subsidiary lines which were sold to the parent company has been unjust, has sent to the stockholders of the company a statement explaining his doings. The statement goes in detail into the reports which have been published in the newspapers since the hearings at St. Louis, in which the Interstate Commerce Commission inquired into the affairs of the company.

Mr. Yoakum says that it is his ambition to build a new business empire in the Southwest, and that the Frisco system constitutes his life work "and it is my purpose to see it on its feet, with its difficulties cleared away. I intend to see that the stockholders get their money out of the property if they stay with it. The property is worth every dollar against it in both stock and bonds under any fair valuation."

His personal profits, he says, represent only a liberal interest on investments that none but believers in that new and undeveloped territory would have attempted.

"We built the system," he says, "in the only way it could be done at the time.

"Criticism of me is more or less natural, following the receivership, and considering my close connection with the company. My principal motive was not selfish personal gain, but the building of the railroad system and the growth of the country in which it lies. The construction of new railroads through sparsely settled Western sections does not appeal to bankers as investments and therefore syndicate financing in accord with existing custom was employed.

"No one will deny the great changes that have taken place in

public opinion during the past ten years. I recognize the public disapproval of dealings between a corporation and its officials. While I believe it ought not to apply to pioneering enterprises which have in the past depended for their success upon syndicate or individual financing, on the whole I am convinced that the policy is right.

"It is equally true that within the same period many other familiar corporate acts, such as contributions to political campaigns, rebating, trade and traffic agreements, have come under the ban of public opinion."

Mr. Yoakum says that because of the exceeding difficulty of getting money for pioneer railroad building in the sparsely settled Southwest in 1897 it became imperative for him to invest his own funds, forming construction and financing syndicates according to the usual practice of the time. He presents the following table of his profits, the roads mentioned being the only lines he had an interest in:

Road.	My sub- scription.	My profits.	My profit less 6 per cent. interest on investment.
St. Louis & Gulf and St. Louis, Memphis & S. E.	\$75,000	\$38,187	\$29,187
St. Louis, B. & M.	300,833	227,580	111,759
St. Louis, San Francisco & New Orleans.	50,000	7,900	3,900
Oklahoma City & Western.	22,500	2,933	1,020
Arkansas Valley & Western.	62,500	11,515	5,283
New Iberia & Northern.	300,000	None	None
Totals	\$810,833	\$288,116	\$151,151

Outside of the above he received \$28,000 in 4½ per cent. bonds from the St. Louis & Gulf Syndicate, and \$37,500 in the sale of the Gulf Construction Company to the Colorado Southern, New Orleans & Pacific.

As to selling securities at less than their par value by a sum in excess of \$30,000,000 the statement says:

"Some of our strongest railroads are now paying as dearly for money as the Frisco ever did. Under the reorganization plan of 1896 the first and second preferred stocks were limited to 4 per cent., and as under the laws of Missouri railroad stock cannot be sold for less than par that plan practically prevented further sale of preferred stock. . . . Grouping the three largest bond issues and taking the net amount of money received, the Frisco paid a total discount, including commissions, of about \$32,000,000. No one received any part of these discounts and commissions except the bankers and investors themselves. . . ."

Mr. Yoakum says that the acquired railroad properties, twelve in number, have all proved profitable to the Frisco, with the possible exception of the Chicago & Eastern Illinois and the New Orleans, Texas & Mexico. "Considered from a broad, constructive standpoint; the larger plans in view and the probable future earnings of these properties, I believe their purchases will be fully justified.

"I confidently believe that the assets of the Frisco will equal the par of all its outstanding bonds, other obligations and stock. The Frisco on account of its superior terminal facilities and other points of advantage, together with its relatively small capitalization, will hold its own with any other railroad in this country. Had it not been for the Mexican revolution since 1910, interchange business with the National Railways of Mexico would have placed the Brownsville line on a paying basis two years ago."

#### How Best to Settle Claims.

1. Courteous treatment of the public.
2. (a) Prompt inspection of damaged freight.  
(b) Prompt tracing of short freight.
3. Issuing promptly and correctly over, short and damage reports.
4. Assisting claimants in making up claims, seeing that they are supported with proper documents when sent in for payment, or before being remitted to auditor for credit after payment.
5. (a) Where inspection shows railroad damages agent should pay claim at once direct to the claimant.  
(b) Where freight is short, claim should be sent to freight claim department, and if goods are short as long as thirty days, claim should be paid at once, investigation made later.
6. Agents and others should not be too technical and should give claimant benefit of any doubtful point.—*Sunset Central Bulletin.*

#### Railway Association Secretaries.

The Society of Railway Associations Secretaries was organized in New York, November 22, by the choice of H. D. Vought, of New York, temporary chairman, and J. E. Fairbanks, of New York, temporary secretary; and a meeting will be held, probably in February, to elect permanent officers. The following ten associations and clubs were represented by the men whose names follow the names of the associations: American Association of General Passenger & Ticket Agents, W. C. Hope; American Electric Railway Manufacturers' Association, H. C. McConnaughy; American Railway Association, W. F. Allen and J. E. Fairbanks; American Society for Testing Materials, Prof. E. Marburg; Master Car & Locomotive Painters' Association of the United States and Canada, A. P. Dane; Central Railway Club, Harry D. Vought; Montreal Railroad Club, James Powell; New York Railroad Club, Harry D. Vought; Pittsburgh Railroad Club, J. B. Anderson; Richmond Railroad Club, F. O. Robinson.

Mr. Vought said that he had received letters, largely favorable, from secretaries of fourteen other organizations. A code of rules was tentatively agreed upon and the chairman will appoint a committee to assist in perfecting a permanent organization.

#### American Society of Civil Engineers.

At the meeting of the American Society of Civil Engineers, to be held on December 17, two papers will be presented for discussion, as follows: "Storage to be Provided in Impounding Reservoirs for Municipal Water Supply," by Allen Hazen, M. Am. Soc. C. E., and "The Depreciation of Public Utility Properties as Affecting Their Valuation and Fair Return," by John W. Alvord, M. Am. Soc. C. E.

#### MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

- AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass. Next convention, May, 1914.
- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass. Convention, May 19, 1914, St. Louis.
- AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York.
- AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill. Next convention, April 21, Houston, Tex.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, St. Louis, Mo.; 3d Thursday and Friday in May.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 29 W. 39th St., New York. Mid-year conference, New York, January 29, 30, 31.
- AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOC.—H. G. McConnaughy, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.
- AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 20-22, 1914, Los Angeles, Cal.
- AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 17-20, Chicago.
- AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Karpen building, Chicago. June 15-17, Atlantic City, N. J.
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—A. R. Davis, Central of Georgia, Macon, Ga.
- AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 West 57th St., New York; 1st and 3d Wed., except June and August, New York.
- AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wenlinger, 11 Broadway, New York; 2d Tuesday of each month, New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Next convention, January 20-22, 1914, New Orleans, La.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, Highland Park, Ill. Annual meeting, June 24, Minneapolis, Minn.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.—C. W. Egan, B. & O., Baltimore, Md. Next convention, May, 1914, St. Paul, Minn.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 112 West Adams St., Chicago. Next convention, May 20-23, New Orleans, La.
- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.
- ASSOCIATION OF WATER LINE ACCOUNTING OFFICERS.—W. R. Evans, Chamber of Commerce, Buffalo, N. Y.
- BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—L. D. Mitchell, Detroit Graphite Co., Detroit, Mich. Meeting with American Railway Bridge and Building Association.



## Traffic News.

At a meeting of the Central Passenger Association last week it was decided to abolish the practice of allowing stop-overs on homeseekers' tickets.

The Merchants & Miners' Line has made a reduction of about 25 per cent. in the rates from Norfolk to Boston and Providence by steamer on potatoes and certain other commodities.

The Central of Georgia and the Atlanta, Birmingham & Atlantic have notified the Georgia State Railroad Commission that they are going to discontinue the sale of interchangeable mileage tickets for intrastate journeys in that state.

The White Audit System of checking passenger train collections has been adopted by the Atlanta, Birmingham & Atlantic, the Fort Dodge, Des Moines & Southern and the Fort Worth & Denver City. The Chicago & North Western, the Chicago, Burlington & Quincy, the Colorado & Southern and the Chicago, Indianapolis & Louisville, have also renewed their arrangements for this service.

The Delaware, Lackawanna & Western has notified employees of the state of New Jersey that in accordance with a recent decision of the State Supreme Court these officers will no longer be carried free on the company's trains. These men are now riding on the railroads of the state without charge by virtue of passes issued to them by the Secretary of State under a law passed a few years ago. The Supreme Court has decided that only members of the legislature and of the court, with a few others, are entitled to free transportation under the law.

The Traffic Bureau of the Merchants' Association of New York City has made a study of the new parcel post rates, which have been announced to go into effect January 1, and finds that as compared with the rates of the express companies now in effect there will be on the great majority of shipments an advantage in sending goods by the parcel post; but after February 1, when the express companies, under the order of the Interstate Commerce Commission, will make a general reduction in their rates, the advantage of the postal rates will be done away with; the rates by express will be the lower.

### Traffic Club of St. Louis.

The sixth annual dinner of the Traffic Club of St. Louis was held on December 2. The following newly elected officers for the ensuing year were installed: President, R. K. Pretty, general agent Great Northern; vice-presidents, Richard Muehlberg, traffic manager Anheuser-Busch Brewing Association; J. L. McNichols, traffic manager Liggett & Myers Tobacco Company; John Fitzgerald, superintendent Louisville & Nashville; O. H. Greene, assistant manager National Lead Company; secretary-treasurer, W. S. Crilly, traffic manager Hargadine-McKittrick Dry Goods Company.

### Changes in Mail Train Schedules.

An improvement in the transcontinental mail service from New York to San Francisco is being made by rearrangements of schedules by the western lines. On December 7, the Atchison, Topeka & Santa Fe changed the schedule of its California Limited train to leave Kansas City at 9:55 a. m., instead of 9:10 a. m.; this in order to wait for the Missouri Pacific train arriving at 9:30 p. m. from St. Louis, where it receives the mail from the Pennsylvania Lines from New York. This would put mail leaving New York at 2:45 a. m. Monday in San Francisco at 10:30 p. m. Thursday. The Chicago, Burlington & Quincy, which has carried the overland mail in connection with the Union and Southern Pacific for 30 years, has a train, No. 7, leaving Chicago at 2:45 a. m., which receives mail from the New York Central Lines and the Pennsylvania Lines. This train's western connection would reach San Francisco at 10:30 a. m., on Friday, or 12 hours later than the Santa Fe. The Burlington has now announced that, effective January 4, train No. 7 will leave Chicago at 2 a. m. instead of 2:45, and arrive at Omaha at 1:15 p. m., a reduction of 50 minutes, while the Union Pacific and Southern Pacific will rearrange their schedules to leave Omaha at 1:30 p. m., instead of 9 a. m., and to arrive at San

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and August, Montreal.  
CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursday, Montreal.  
CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.  
CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.  
CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.  
ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after second Saturday, Harrisburg, Pa.  
ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, Oliver building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.  
FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va. Next convention, May 20-22, Galveston, Tex.  
GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.  
INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.  
INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, 922 McCormick building, Chicago. Annual convention, May 18-22, Chicago.  
INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 829 West Broadway, Winona, Minn. Next Convention, July, Chicago.  
INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Next convention, third Tuesday in August.  
MAINTENANCE OF WAY & MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—T. I. Goodwin, C. R. I. & P., Eldon, Mo. Next convention, November 17-19, 1914, Detroit, Mich.  
MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.  
MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Karpen building, Chicago. June 10-12, Atlantic City, N. J.  
MASTER CAR & LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass.  
NATIONAL RAILWAY APPLIANCE ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.  
NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.  
NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3rd Friday in month, except June, July and August, New York.  
NORTHERN RAILROAD CLUB.—C. L. Kennedy, C. M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.  
PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, Union Station, Peoria; 2d Thursday.  
RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.  
RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York.  
RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.  
RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.  
RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Mobile & Ohio, Mobile, Ala.  
RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo.  
RAILWAY DEVELOPMENT ASSOCIATION.—W. Nicholson, Kansas City Southern, Kansas City, Mo.  
RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa.  
RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio.  
RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.  
RAILWAY TEL. & TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.  
RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday except June, July and August.  
ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill. Next convention, September 8-10, 1914, Chicago.  
ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.  
SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meeting with annual convention Railway Signal Association.  
SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago.  
SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.  
SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.  
TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.  
TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillsburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.  
TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.  
TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.  
TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.  
TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.  
TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next convention, June 16, Jacksonville, Fla.  
TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.  
TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.  
TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Next meeting, Chicago.  
UTAH SOCIETY OF ENGINEERS.—Fred D. Ulmer, Oregon Short Line, Salt Lake City, Utah; 3rd Friday of each month, except July and August.  
WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.  
WESTERN RAILWAY CLUB.—J. W. Taylor, Karpen building, Chicago; 3d Tuesday of each month, except June, July and August.  
WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

San Francisco at 2 p. m. on Thursday instead of 10:30 the following morning, 62 hours from Chicago and 86 from New York. The trains from New York to Chicago, Chicago to Omaha, and Omaha to San Francisco are all solid mail and express trains, carrying no passengers. The Burlington also has another train, connecting with the Union and Southern Pacific, which makes approximately the same time but which now will carry only first-class mail west of Omaha. On December 14 the Chicago, Rock Island & Pacific also changed the schedule of its Golden State Limited train to leave Chicago at 8:05 p. m., instead of 9 p. m., arriving at San Francisco at 9:15 a. m.

#### Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railroads of the American Railway Association, in presenting statistical bulletin No. 157, giving a summary of car surpluses

and shortages by groups from August 1, 1912, to December 1, 1913, says:

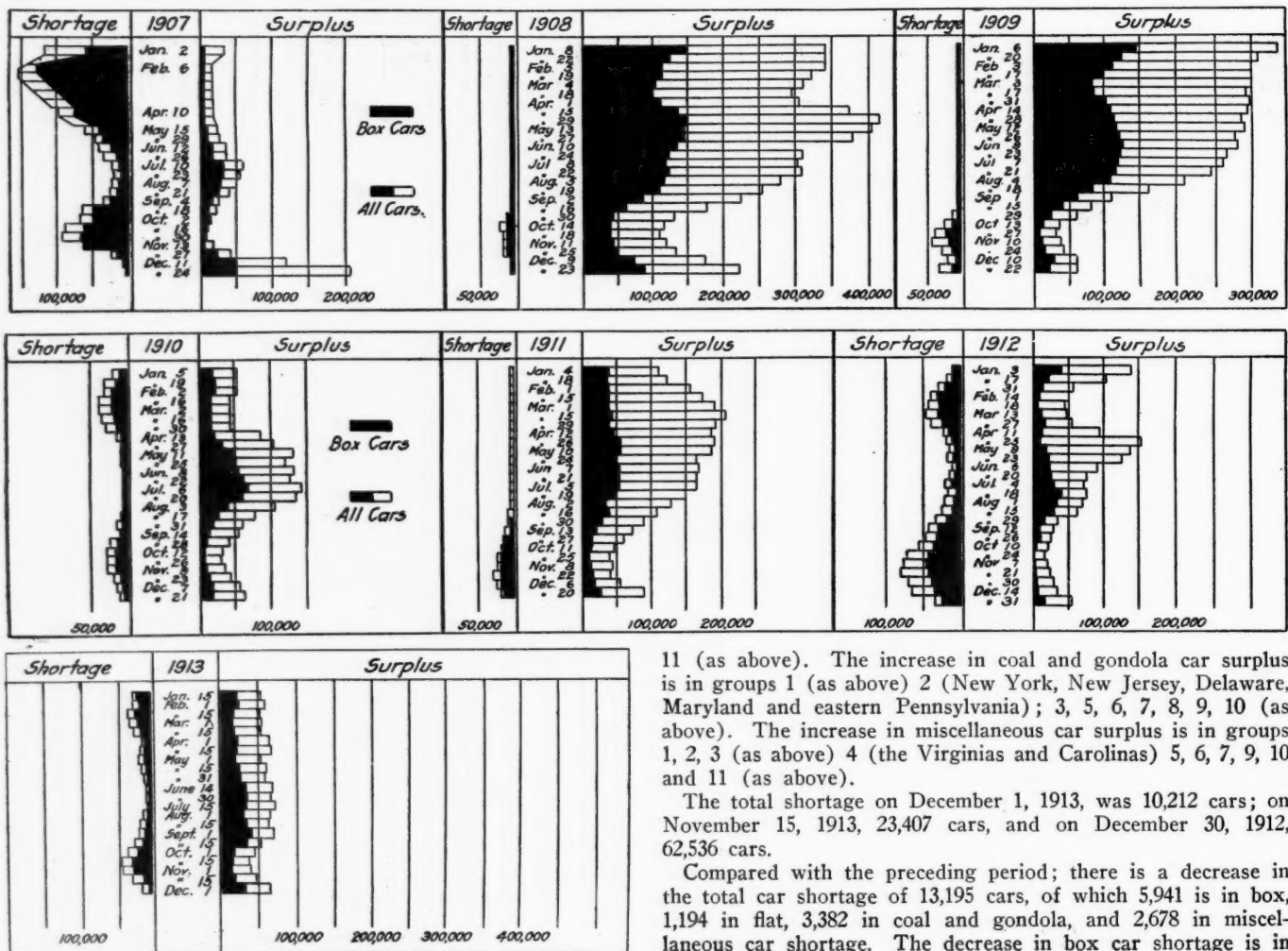
The total surplus on December 1, 1913, was 67,466 cars; on November 15, 1913, 46,059 cars, and on November 30, 1912, 26,135 cars.

Compared with the preceding period; there is an increase of 21,407 cars, of which 8,602 is in box, 1,426 in flat, 7,101 in coal and gondolas and 4,278 in miscellaneous car surplus. The increase in box car surplus is in groups 1 (New England lines); 3 (Ohio, Indiana, Michigan and western Pennsylvania); 5 (Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida); 6 (Iowa, Illinois, Wisconsin and Minnesota); 7 (Montana, Wyoming, Nebraska and the Dakotas); 8 (Kansas, Colorado, Oklahoma, Missouri and Arkansas); 10 (Washington, Oregon, Idaho, California, Nevada and Arizona) and 11 (Canadian lines). The increase in flat car surplus is in groups 3, 6, 7 (as above), 9 (Texas, Louisiana and Mexico); 10 and

CAR SURPLUSES AND SHORTAGES.

Date	No. of roads.	Surpluses				Shortages			
		Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Box.	Flat.	Coal, gondola and hopper.	Other kinds.
Group *1.—December 1, 1913.....	7	155	53	40	298	31	6	34	216
" 2.—" 1, 1913.....	32	441	48	2,903	183	132	0	150	0
" 3.—" 1, 1913.....	26	2,908	668	1,884	1,296	101	0	994	450
" 4.—" 1, 1913.....	12	3,001	345	862	818	340	271	3,283	30
" 5.—" 1, 1913.....	22	1,056	100	2,123	771	1,095	134	576	20
" 6.—" 1, 1913.....	28	5,873	469	3,450	3,043	378	4	2	40
" 7.—" 1, 1913.....	4	129	50	998	868	139	2	16	0
" 8.—" 1, 1913.....	16	1,474	205	1,920	1,710	446	42	16	38
" 9.—" 1, 1913.....	13	1,367	168	696	1,092	73	3	8	32
" 10.—" 1, 1913.....	22	5,932	1,870	2,745	7,674	208	15	16	16
" 11.—" 1, 1913.....	5	3,855	664	0	1,261	756	5	0	94
Total .....	187	26,191	4,640	17,621	19,014	3,699	482	5,095	936

\*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin and Minnesota lines; Group 7—Montana, Wyoming, Nebraska, North Dakota and South Dakota lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Washington, Oregon, Idaho, California, Nevada and Arizona lines; Group 11—Canadian lines.



Car Surpluses and Shortages, 1907 to 1913.

11 (as above). The increase in coal and gondola car surplus is in groups 1 (as above) 2 (New York, New Jersey, Delaware, Maryland and eastern Pennsylvania); 3, 5, 6, 7, 8, 9, 10 (as above). The increase in miscellaneous car surplus is in groups 1, 2, 3 (as above) 4 (the Virginias and Carolinas) 5, 6, 7, 9, 10 and 11 (as above).

The total shortage on December 1, 1913, was 10,212 cars; on November 15, 1913, 23,407 cars, and on December 30, 1912, 62,536 cars.

Compared with the preceding period; there is a decrease in the total car shortage of 13,195 cars, of which 5,941 is in box, 1,194 in flat, 3,382 in coal and gondola, and 2,678 in miscellaneous car shortage. The decrease in box car shortage is in all groups, except 7 (as above). The decrease in flat car short-



age is in all groups except 7 and 8 (as above). The decrease in coal and gondola car shortage is in all groups except 1 and 11 (as above). The decrease in miscellaneous car shortage is in all groups except 9 (as above).

Compared with the corresponding period of 1912; there is an increase in the total car surplus of 41,331 cars, of which 20,709 is in box, 1,721 in flat, 10,022 in coal and gondola, and 8,879 in miscellaneous car surplus. There is a decrease in the total car shortage of 52,324 cars, of which 35,024 is in box, 3,900 in flat, 7,683 in coal and gondolas, and 5,717 in miscellaneous car shortage.

The accompanying table gives car surplus and shortage figures by groups for the last period covered in the report, and the diagram shows total bi-weekly surpluses and shortages from 1907 to 1913.

#### Car Location.

The accompanying table, which was taken from bulletin No. 12-A of the American Railway Association, gives a summary of freight car location by groups on November 15, 1913.

CAR LOCATION ON NOVEMBER 15, 1913.

	New England.	N.Y., Del., Md., Eastern Pa.	N.J., Md., Mich., Western Pa.	Ohio, Ind., Va., No. & So. Carolina.	W. Va., Ky., Tenn., Miss., Ala., Ga., Fla.	Iowa, Ill., Wis., Minn.	Mont., Wyo., Neb., Dakotas.	Kans., Colo., Okla., Mo., Ark.	Texas, La., New Mexico.	Oregon, Idaho, Nev., Cal., Ariz.	Can- adian Lines.	Grand Total.
Total Cars Owned.....	88,017	691,047	281,236	204,848	174,621	487,892	18,845	154,658	31,975	135,456	145,358	2,413,953
Home Cars on Home Roads.....	39,266	364,143	89,018	99,412	82,335	320,053	6,431	77,116	14,285	72,893	94,004	1,258,956
Home Cars on Foreign Roads.....	48,751	326,904	192,218	105,436	92,286	167,839	12,414	77,542	17,690	62,563	51,354	1,154,997
Foreign Cars on Home Roads.....	58,196	300,960	212,204	87,943	82,138	194,710	11,898	80,372	34,103	59,174	43,807	1,165,505
Total Cars on Line.....	97,462	665,103	301,222	187,355	164,473	514,763	18,329	157,488	48,388	132,067	137,811	2,424,461
Excess or Deficiency.....	9,445	*25,944	19,986	*17,493	*10,148	26,871	*516	2,830	16,413	*3,389	*7,547	10,508
Surplus.....	363	5,410	958	5,866	903	8,045	717	4,531	3,229	13,588	2,449	46,059
Shortage.....	645	1,838	4,540	6,542	3,323	1,052	153	1,471	359	1,333	2,151	23,407
Shop Cars—												
Home Cars in Home Shops.....	5,098	33,609	19,459	13,066	11,540	26,136	504	9,796	2,251	4,480	6,406	132,345
Foreign Cars in Home Shops.....	1,126	7,674	6,578	1,815	2,021	5,416	491	2,508	1,140	2,130	266	31,165
Total Cars in Shops.....	6,224	41,283	26,037	14,881	13,561	31,552	995	12,304	3,391	6,610	6,672	163,510
Per Cent. to Total Cars Owned—												
Home Cars on Home Roads.....	44.61	52.69	31.65	48.53	47.15	65.60	34.13	49.86	44.68	53.81	64.67	52.15
Total Cars on Line.....	108.45	96.25	107.03	91.46	94.19	105.51	97.26	100.14	151.33	97.50	94.81	100.44
Home Cars in Home Shops.....	5.79	4.86	6.92	6.38	6.61	5.39	2.68	6.33	7.04	3.31	4.41	5.48
Foreign Cars in Home Shops.....	1.02	1.11	2.34	.88	1.16	1.12	2.60	1.51	3.57	1.57	.18	1.29
Total Cars in Shops.....	6.81	5.97	9.26	7.26	7.77	6.51	5.28	7.84	10.61	4.88	4.59	6.77

\*Denotes deficiency.

#### Joint Report on B. & M. Freight Rates.

The Massachusetts Public Service Commission made public at Boston this week the report of the conference of the Interstate Commerce Commission and the commissions of the New England states on the Boston & Maine's proposition to increase freight rates. This report has no authoritative character, but the rates approved in it are expected soon to be embodied in orders to be issued by the several commissions. Following are the salient features of the report:

"We are clearly of the opinion that there should be a substantial advance now, provided that such additional revenue can be obtained without imposing upon the public unreasonable charges, and provided further that some assurance can be given that the money will be prudently expended in the public interest.

"We do not assent to claims of counsel for the company that such increase should amount to at least \$5,000,000 a year. It cannot be known until the property is once more efficiently and properly operated and until its leasehold lines have been valued, how much the advance should be.

"The Boston & Maine, on the basis of its present rates, is bankrupt. From an analysis of its operating expenses it seems probable that its income from operation will fall at least \$1,000,000 short of what it was in the preceding fiscal year.

"Certain charges against income will be materially increased during the current year. Owing to an advance in the rate of interest, the interest charges will be increased approximately \$600,000. Owing to an increase in the per diem charge for the use of freight cars, the item for hire of equipment, if the same amount of business is transacted, and if no greater car efficiency can be secured, will be approximately \$400,000 larger. It now appears probable that for the year 1914 the road will lack, if no increase in rates is allowed, \$2,000,000 of sufficient income to pay its taxes, its interest, and its fixed charges, without the payment of any dividend upon its capital stock.

"This deplorable showing is in part due to mismanagement. The Boston & Maine has outstanding \$27,000,000 of short-time paper, which it will carry for the current year at a charge of about 7½ per cent., as compared with 5¼ per cent. for the preceding year. Of this short-time paper \$20,000,000 was used to purchase stocks which the Boston & Maine now owns. Assuming that these stocks may finally be worth the price paid, which is doubtful, their purchase at the time was utterly unnecessary and ill-advised, and the consequences of those transactions ought not to be visited upon the rate-paying public.

"The attempt of the New York, New Haven & Hartford to acquire a control of the Boston & Maine and combine that system in operation with its own proved disastrous, and the effect is still obvious in the operating cost of the Boston & Maine.

"We have divided the Boston & Maine into two classes. Class A embraces the following: Main lines between Boston and Portland, main line between Boston and Concord, N. H.; entire main line of the Fitchburg; Cheshire and Troy branches of the Fitchburg, main line between Springfield, Mass., and Windsor, Vt.; main line from Worcester to Nashua, Stony Brook branch, Saugus branch, Lexington branch, Watertown branch and Med-

ford branch. Class B includes all other lines of the system.

"We have approved the railroad maximum for Class A lines. We think that a schedule 16⅔ per cent. higher should be applied on Class B lines, and that between points on Class A and Class B lines a constructive mileage should be made up by adding together the actual mileage on the Class A line and the actual mileage on the Class B line, plus 25 per cent. of Class B distance, and that to this constructive mileage the Class A scale should be applied.

"The scales thus approved differ radically from that first presented by the railroad. While some increase in revenue will result to the carrier our central thought has been to provide a system of local class rates which would remove the glaring discriminations between individuals and localities which now exist and pave the way for a proper revision of the commodity rates of that company.

"An advance in mileage book rates is urged. A radical change in the directorate is recommended, and Morris McDonald is declared to be unable adequately to supervise two roads; he should give all his time and energy to the Boston & Maine and none to the Maine Central. . . . The traffic departments of the Boston & Maine and the New Haven should finally be entirely separated.

"The present financial condition of the Boston & Maine is critical. Nobody can tell exactly what should be done to protect the just interests of all concerned. It may finally turn out that these properties should be thrown into the hands of a receiver, and pass through a process of reorganization, but this would be a calamity which ought to be avoided if possible. The present condition was years in forming, and will require years in the correction. If disaster is to be avoided, all interested parties must exercise forbearance and must undergo temporary inconvenience.

"The stockholders of the Boston & Maine cannot reasonably

expect to receive further dividends in the immediate future. The financiers who are carrying the short-time paper might well abate something from their present demands. The owners of the leased properties might well accept something less than the full rent reserved for the next two or three years. The public must expect to sustain some part of the burden. It should not be taxed for the mismanagement of this property, but it should remember that the cost of furnishing the service now demanded has increased, and that this property is entitled to a fair return."

#### An English View.

Sir George Paish, of London, editor of the *Statist*, now in America, says that he is convinced that freight rates on the railroads of the United States should be higher. "The rail road president who sees his expenditures increasing by leaps and bounds and his income decreasing may be pardoned for advocating better rates. . . . The American railroads by their lack of confidence in the future, and their uncertainty with regard to labor conditions and net income, have promoted business depression. They have cut down their orders for steel rails, thereby causing steel mills to curtail their operations.

"British investors are heavily interested in American railways, and we do not want another period like that in the nineties, when many railroads defaulted on their interest.

"On the whole, I have no apprehensions as to the future. As far as I am able to judge, the people of the United States may rest assured that there will be no panic. The business depression is general throughout the world, being felt in South America as well as in Europe. It is by no means most acute in the United States."

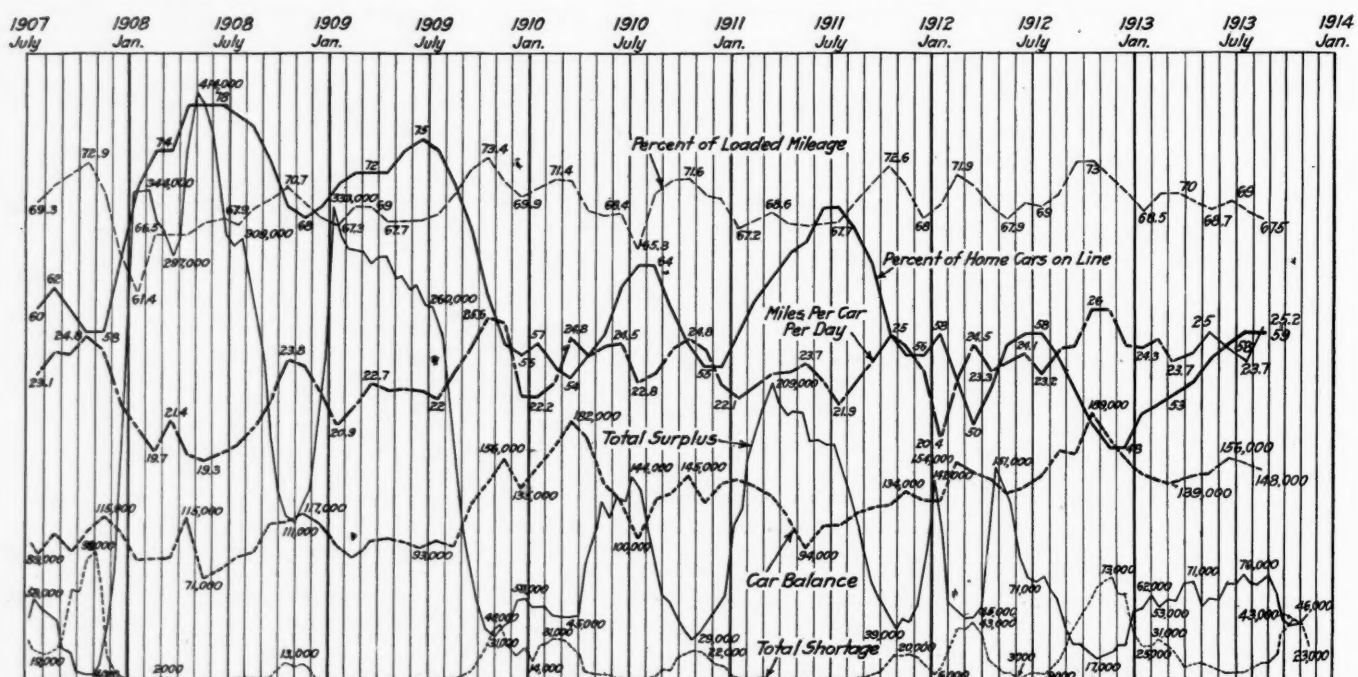
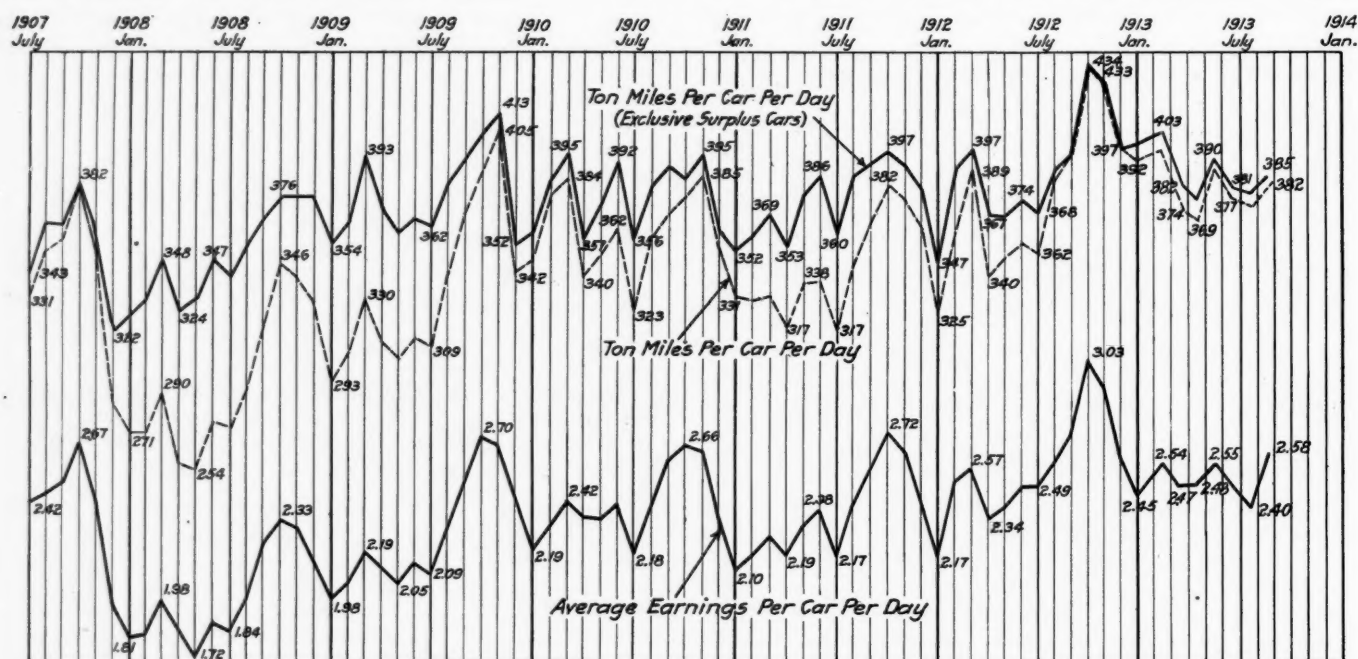
#### Car Balance and Performance.

Arthur Hale, chairman of the committee on relations between railroads, of the American Railway Association, in presenting statistical bulletin No. 158, covering car balances and performances for August, says:

The committee presents herewith statistical bulletin No. 158, covering car balance and performance for August, 1913.

The miles per car per day were 25.2, compared with 23.7 in July. This figure for August, 1912, was 24.3.

Ton miles per car per day for August were 382, compared with 375 in July. This is a decrease of .78 per cent. compared



Freight Car Mileage, Earnings and Performance, 1907 to 1913.



CAR BALANCE AND PERFORMANCE IN AUGUST, 1913.

	New England	N. Y., N. J., Del., Md., Eastern Pa.	Ohio, Ind., Mich., Western Pa.	Va., W. Va., No. and So. Carolina.	Ky., Tenn., Miss., Ala., Ga., Fla.	Ill., Wis., Minn.	Iowa, Neb., Dakotas.	Mont., Wyo., Okla., Mo., Ark.	Kan., Colo., Mo., Ark.	Texas, La., New Mex.	Ore., Idaho, Nev., Cal., Ariz.	Canadian Lines.	Grand Total.
Revenue freight cars owned.....	90,099	704,791	203,061	188,787	173,146	443,133	18,347	146,179	142,551	39,099	116,543	155,317	2,273,623
Average number of system cars on line.....	46,153	395,822	122,275	100,493	87,623	317,941	5,611	75,091	75,091	27,916	138,054	164,663	2,298,176
Railway-owned cars: Average foreign on line.....	46,766	296,133	106,650	63,404	64,695	155,986	8,561	67,460	67,460	21,139	41,881	37,728	1,361,220
Total Railway-owned cars on line.....	92,919	691,955	228,925	165,897	152,318	473,927	14,172	142,551	142,551	39,099	116,543	155,317	2,273,623
Excess.....	2,820	*12,836	25,864	*22,890	*20,828	30,794	*4,175	*3,628	*3,628	11,183	*21,511	*9,346	*24,553
Per cent. of cars on line to total owned:													
Home.....	51	56	60	53	51	72	30	51	51	64	48	71	59
Foreign.....	52	42	53	35	37	35	47	42	42	76	29	23	40
All railways.....	103	98	113	88	88	107	77	93	93	140	77	94	99
Private cars on line.....	3,705	35,432	10,135	3,602	10,075	17,052	2,543	9,819	9,819	2,965	11,474	7,015	113,817
Total, all cars on line.....	96,624	727,387	239,060	169,499	162,393	490,979	16,715	152,370	152,370	42,064	128,017	162,332	2,387,440
No. of freight engines owned.....	1,433	10,476	3,021	3,518	2,955	7,288	510	2,943	2,943	837	652	4,400	7,335
Average freight engine owned.....	1,433	10,476	3,021	3,518	2,955	7,288	510	2,943	2,943	837	652	4,400	7,335
Total freight car mileage.....	56,624,291	628,280,899	157,879,483	135,983,042	133,751,152	350,575,331	28,659,705	105,024,157	105,024,157	31,855,572	119,805,452	108,391,591	1,856,830,667
Average mileage per car per day.....	15.9	58.7	21.2	25.3	26.6	23.0	55.3	23.3	23.3	24.4	30.1	21.5	25.2
Per cent. loaded mileage.....	72.0	58.7	80.5	67.3	70.6	70.6	74.3	69.5	69.5	71.3	72.2	74.5	67.5
Ton-miles of freight, including company freight.....	665,846,875	9,007,929,722	2,804,661,992	2,311,178,903	1,933,094,940	4,623,395,312	439,199,955	1,514,368,356	1,514,368,356	463,041,526	1,794,556,462	1,811,418,378	27,368,692,421
Average ton-miles, including company freight:													
Per car-mile.....	11.8	14.5	18.4	17.0	14.5	14.8	15.3	14.4	14.4	14.5	15.2	16.7	15.2
Per loaded car-mile.....	16.3	24.7	22.9	25.3	20.6	20.9	20.6	20.7	20.7	20.4	22.4	21.1	22.5
Per car per day.....	222	404	390	440	386	339	848	336	336	355	458	360	382
Gross freight earnings.....	\$7,134,953	\$51,957,251	\$15,389,024	\$12,271,877	\$12,240,131	\$36,211,240	\$3,258,971	\$19,631,393	\$19,631,393	\$3,830,841	\$17,485,903	\$10,846,912	\$190,258,496
Average daily earnings: Per car owned.....	\$2.55	\$2.40	\$2.44	\$2.10	\$2.28	\$2.64	\$5.73	\$4.33	\$4.33	\$4.43	\$3.65	\$2.12	\$2.65
Per railroad car on line.....	2.38	2.46	2.17	2.39	2.59	2.46	7.42	4.65	4.65	4.36	4.72	2.25	2.70
All cars on line.....	2.38	2.33	2.08	2.34	2.43	2.38	6.29	4.36	4.36	2.94	4.34	2.16	2.58

\*Denotes deficiency.

with the figure for August, 1912, which gives a total of 385. The proportion of home cars on line was 59 per cent., which is the same as July, 1913. This is an increase of three points over August, 1912.

The per cent. of loaded car mileage decreased from 68.1 per cent. in July to 67.5 per cent. in August, 1913. This figure for August, 1912, was 70.1 per cent.

The average earnings per car per day for all cars on line increased 18 cents to \$2.58 in August, 1913. This figure for August, 1912, was \$2.60.

The accompanying table gives car balance and performance in the month covered by the report, and the diagram shows car earnings and car mileage and different car performance figures monthly from July, 1907.

#### State Commissioners Favor Uniformity of Express Rates.

Members of the express committee of the National Association of Railway Commissioners, consisting of a member of each state railway commission, held a meeting at the Hotel La Salle, Chicago, on December 11 and 12 to consider the effect of the Interstate Commerce Commission's system of express rates, ordered effective February 1, on the intrastate rates. The meeting was presided over by Chairman Martin S. Decker, of the New York second district commission. W. A. Ryan, representing the Interstate Commerce Commission, outlined the basic principles of the commission's system of making rates by blocks, and T. B. Harrison, attorney for the American and Adams express companies, addressed the meeting on the effect of the rates on the companies. He said that the new rates would reduce the revenues of the five principal companies by from \$15,000,000 to \$20,000,000 per year in addition to the reduction in their business caused by the parcel post competition. They can only make up for these reductions by increased efficiency, which would be facilitated by uniformity in the state rates. In 15 states the application of the commission's rates would increase the revenue, while in other states the rates would be reduced by from 1.18 to 19.24 per cent. The commission's reductions had been chiefly on the packages less than 50 pounds, and if the states would permit them to charge the 100-pound rates fixed by the commission the companies were hopeful that they could work out their salvation.

There was considerable opposition to an approval of the Interstate Commerce Commission's rates among the commissioners of states whose rates would be increased by their application, but the meeting finally went on record as favoring uniformity of rates on the block system prescribed by the federal commission, with a provision for retaining advantages in state rates by making "sub-block" rates subject to local conditions. A sub-committee of ten members was appointed to work out a plan of adopting the sub-block system to the commission's plan and rates.

#### INTERSTATE COMMERCE COMMISSION.

The commission has further suspended from December 20 to June 20, a tariff of the Oregon Short Line, which proposed to eliminate certain routes applying on shipments of green fruit in carloads from stations on the Oregon Short Line to eastern destinations.

The commission has further suspended from December 30 to June 30, schedules in a tariff of W. H. Hosmer, agent, which provided for substantial increases in rates on box board in carloads from Wilmington, Ill., to Milwaukee, Wis., and between certain other points.

The commission has further suspended from December 20 to June 20, tariffs of the St. Louis Southwestern which proposed to increase rates on lumber and other forest products from stations on the St. Louis Southwestern to points in Iowa, Minnesota, Missouri, South Dakota, Illinois and Wisconsin.

#### Discrimination in Car Distribution.

*The Huerfano Coal Company, et al., v. Colorado & Southeastern, et al. Opinion by Commissioner Marble:*

This case arises because of the dissatisfaction with the methods

of car distribution practised by the defendants. The Colorado & Southeastern, an adjunct of the Victor-American Fuel Company, and a common carrier has trackage rights over the Colorado & Southern to Trinidad, a point upon the Atchison, Topeka & Santa Fe, under a contract which stipulates that the Southeastern shall not engage in business at any point upon the Colorado & Southern. It has been held that mines upon the Colorado & Southern have no claim upon the Colorado & Southeastern for cars or service. That road, having no cars, the duty of supplying them to shippers on its lines is undertaken by the Colorado & Southern and the Denver & Rio Grande jointly. In addition the Southeastern, by reason of the trackage rights to Trinidad, is able to secure coal cars from the Santa Fe. It thus happens, that the Victor-American Fuel Company is at all times well supplied with Santa Fe cars, whereas, shippers on the other two lines have no claim to them. The commission finds that this arrangement is discriminatory and says that each carrier shall be charged with the duty of furnishing cars for the transportation conducted over its line. The carrier's obligation to furnish cars to points upon the lines of its connections is joint with the latter, and contracts with them cannot relieve it of its portion of such joint liability.

#### Government Loses in Oregon Short Line Through Route Case.

*The United States of America v. Union Pacific et al. Opinion by Commissioner Clark:*

The United States, in a complaint apparently not ordered by any executive officer or lawfully empowered department of the government, alleges that the failure and refusal of the defendants to establish through routes and joint rates between Chicago and other points and Oregon Short Line stations via the Northern Pacific and the Atchison, Topeka & Santa Fe, subjects these carriers to undue prejudice and disadvantage, deprives the government of the full benefit of land-grant deductions reserved to it by statute, and defeats the spirit and purpose of the so-called public highways act. The commission finds that these allegations of undue disadvantage are not sustained, and holds that existing through routes via the Union Pacific are not shown to be unreasonably long, inadequate or unsatisfactory. The Union Pacific and Oregon Short Line are operated jointly and under a common management or control, and no facts are shown which overcome the clear intent of section 15 of the act. The commission is not empowered to require carriers to grant to the United States free transportation or other rates or concessions than those afforded the general public, and is not deprived of jurisdiction to consider the merits of the controversy by absence of affirmative showing of the right of the officers presenting the complaint to do so in the name of the United States. (28 I. C. C., 518.)

#### STATE COMMISSIONS.

The Louisiana railroad commission has denied a petition of several railways for approval of the national code of uniform demurrage rules and regulations of the American Railway Association.

The Railroad Commission of Mississippi has ordered a reduction in the rates for the transportation of syrup, to go into effect January 1. The makers of syrup have a large crop and they say that they are unable to reach the markets on account of the high freight rates.

The Illinois Railroad and Warehouse Commission has ordered the Chicago & Alton to run two of its Chicago-St. Louis passenger trains via East St. Louis and the Eads bridge, instead of over the Merchants' bridge. By the last named route the trains avoid East St. Louis.

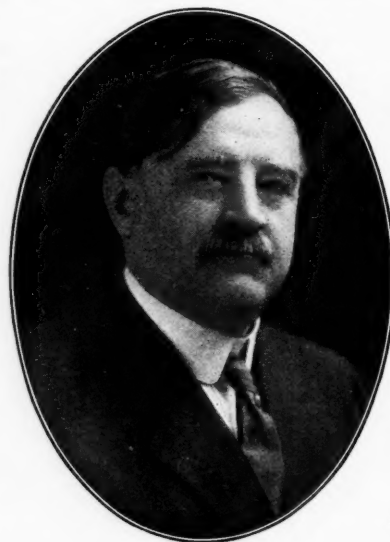
The Louisiana railroad commission has approved a petition of the railways of the state for authority to withdraw from sale mileage books and to substitute a penny script book to be sold at \$25 and to include \$30 in coupons, of one cent each, interchangeable on all lines in the state, to be accepted on trains or in exchange for tickets at stations. This is accepted in lieu of the proposal of the commission to fix the local passenger rate at 2½ cents per mile.

## Railway Officers.

### Executive, Financial and Legal Officers.

The statement in our issue of December 5, page 1096, that Oscar Lawler had been elected auditor of the San Pedro, Los Angeles & Salt Lake, with office at Los Angeles, Cal., was in error. Mr. Lawler has been elected a director of the company succeeding H. I. Bettis, deceased, but the appointment of an auditor has not been made.

Edward M. Hyzer, for the past four years general counsel of the Chicago & North Western at Chicago, has been appointed



E. M. Hyzer.

vice-president and general counsel, in charge of the law department of that road and the Chicago, St. Paul, Minneapolis & Omaha, with office at Chicago. Mr. Hyzer was born December 10, 1854, at Janesville, Wis. After receiving a public school education he studied law under Judge John B. Cassoday of the Wisconsin Supreme Court, and was admitted to the bar in 1879. From 1899 to April, 1909, he was Wisconsin attorney for the Chicago & North Western, from which position he was promoted to the office of general counsel at Chicago. For about six

years previous to 1909 Mr. Hyzer was a member of the law firm of Cary, Upham & Black of Milwaukee, Wis.

### Operating Officers.

A. G. Whittington, superintendent of the San Antonio division of the International & Great Northern, has been appointed acting general manager, with office at San Antonio, Tex., succeeding Henry Martin, deceased.

J. F. Alsip, chief dispatcher, has been appointed trainmaster of the Tacoma division of the Northern Pacific, at Tacoma, Wash., and J. F. Coleman has been appointed chief dispatcher to succeed him.

The following have been appointed assistant superintendents of the St. Louis & San Francisco, with supervision over station work: J. J. Cummins, Northern division; C. H. Hensley, Ozark division; C. F. Kirchner, Southeastern division; C. M. Clark, Eastern division; E. E. Carter, Kansas division; C. A. Irvin, Red River division; C. O. Claiborne, Western division; R. H. Phinney, Central division.

J. C. Stuart, vice-president of the Erie, in charge of operation, has resigned, on account of continued ill health. Mr. Stuart is now on leave of absence, and on resuming duty will become assistant to the president, with office at New York. Mr. Stuart's retirement from the vice-presidency is followed by a number of changes in the operating department, all to take effect January 1. Three grand operating divisions will be established instead of two, the Ohio grand division (the lines west of Salamanca) being divided and the western part being made into the Chicago Terminal grand division. Albert J. Stone, general manager of the Eastern grand division, with office at New York, continues general manager of that division, and will be the ranking general manager. While Mr. Stone's title will be the same as at present, he succeeds to the duties of Vice-President Stuart, with authority throughout the Erie lines. Heads of departments heretofore reporting to the vice-president in charge of operation will now report to the general manager at New York. R. S. Parsons, now assistant general manager of the Erie (Eastern) grand division, will become general manager of the Ohio division, with office at



Cleveland, Ohio. J. B. Dickson, now superintendent of the New York division, is appointed assistant general manager of the Ohio grand division, with office at Cleveland. H. O. Dunkle, general manager of the Ohio division, becomes general manager of the Chicago division and the Lake Lines, with office at Chicago. F. B. Lincoln, now assistant to the receiver of the Pittsburgh, Shawmut & Northern, is appointed general superintendent of the Erie grand division, with office at New York City. W. A. Baldwin, superintendent of the Delaware division, becomes assistant general superintendent of the Erie grand division, with office at New York City. E. W. Batchelder, now assistant general manager of the Ohio division, is appointed general agent at Jamestown, N. Y. C. P. Eckels, superintendent of the Wyoming division, is made superintendent of the Delaware division, with office at Susquehanna, Pa. J. J. Mantell, now terminal trainmaster at Jersey City, is appointed superintendent of the Wyoming division, with office at Dunmore, Pa. E. R. Allen, general agent at Jamestown, is appointed assistant superintendent of terminals at Jersey City, N. J. A. B. Shafer, assistant superintendent of the New York, Susquehanna & Western, and the Wilkes-Barre & Eastern, is appointed superintendent of those roads, with office at Jersey City, N. J. M. E. Johns, now superintendent of the two roads last named, becomes superintendent of terminals of the New York Susquehanna & Western, with office at Jersey City, N. J.

#### Traffic Officers.

M. F. Smith has been appointed general agent of the Kansas City Southern at Los Angeles, Cal.

W. H. Guerin, general agent, passenger department of the Chicago & North Western at Detroit, Mich., has been retired on a pension.

P. B. Norton has been appointed agent passenger department of the Union Pacific at Fresno, Cal., and S. F. Hilton, agent freight department.

F. M. Williams has been appointed division freight agent of the Atchison, Topeka & Santa Fe, with headquarters at Trinidad, Col., succeeding W. P. Matchette, assigned to other duties.

A. G. Sheer, chief of the tariff bureau of the Atchison, Topeka & Santa Fe at Chicago, has been appointed also chief of the tariff bureau of the St. Louis, Rocky Mountain & Pacific, with headquarters at Chicago.

W. G. Brooks has been appointed soliciting freight agent of the Georgia Southern & Florida, with headquarters at Jacksonville, Fla., and Charles G. Norris has been appointed soliciting freight agent, with headquarters at Macon, Ga., succeeding William Henderson, resigned to go to another company.

M. P. Davis, soliciting agent of the Louisville & Nashville at Birmingham, Ala., has been appointed traveling freight agent, with headquarters at Jacksonville, Fla., succeeding Lee A. Dwelle, who has been transferred to Tampa, and W. T. Westbrook has been appointed soliciting agent at Birmingham, Ala., succeeding Mr. Davis.

#### Engineering and Rolling Stock Officers.

R. W. Pritchard has been appointed assistant superintendent, car department of the Terminal division of the Rock Island Lines, with headquarters at Chicago.

F. T. Beckett, resident engineer of the El Paso & Southwestern, has been appointed engineer maintenance of way of the Chicago, Rock Island & Pacific at El Reno, Okla.

E. P. Weatherley, division engineer of the Kansas City Terminal Railway at Kansas City, Mo., has been appointed engineer maintenance of way, with headquarters at Kansas City.

C. F. Burrell has been appointed engineer and roadmaster of the Kentucky & Indiana Terminal at Louisville, Ky., succeeding J. B. Wilson, engineer, and J. J. McKenzie, roadmaster, resigned.

The title of R. Collett, superintendent fuel service of the St. Louis & San Francisco, has been changed to superintendent locomotive performance. P. O. Wood has been appointed assistant superintendent locomotive performance, with headquarters at Springfield, Mo.

F. L. Burckhalter, district engineer of the Southern Pacific at Portland, Oregon, has had his jurisdiction extended over the Portland, Eugene & Eastern as chief engineer, succeeding R. T. Guppy, resigned to engage in special work for the Southern Pacific at San Francisco, Cal.

A. M. Burt, superintendent of the Northern Pacific at Spokane, Wash., whose appointment as chief engineer maintenance of way, with office at St. Paul, has been announced, was born May 1, 1866, at Syracuse, N. Y. He was educated in the common schools and college preparatory schools of New York and Massachusetts, and entered railway service in the engineering department of the Colorado Midland in March, 1885. He served in various capacities from rodman to assistant engineer for the Colorado Midland, Northern Pacific, Adirondack & St. Lawrence and Chicago & North Western to January, 1897, and from January 1, 1897, to March 1, 1902, was supervisor bridges and buildings of the Northern Pacific at Minneapolis. From March 1, 1902, to October 10, 1903, he was assistant superintendent of the Northern Pacific at Grand Forks, N. D., and from October 10, 1903, until his recent appointment, effective January 1, he has been division superintendent of the Northern Pacific successively at Jamestown, N. D., Fargo, N. D., Missoula, Mont., and Spokane, Wash.

#### OBITUARY.

C. S. Musson, traveling freight agent of the New York, Chicago & St. Louis, at Chicago, died at his home at Wilmette, Ill., on December 14.

James H. Crawford, secretary, treasurer and general manager of the Shippers' Refrigerating Car Company, Chicago, died on December 11, at Chicago.

John W. Thomas, Jr., president and general manager of the Nashville, Chattanooga & St. Louis, died on December 17, at his home in Nashville, Tenn. He was a son of the late Major J. W. Thomas, former president of the road. J. W. Thomas, Jr., was born at Murfreesboro, Tenn., in 1856. After graduating from Vanderbilt College he entered railroad service in 1878, and for the next three years was a locomotive engineer on the Nashville, Chattanooga & St. Louis. In the succeeding two years he was a trainmaster; for two more years, engineer, conductor, operator and office man; for three years to 1889, purchasing agent and secretary to the president and general manager. For the next ten years he held the positions of assistant general manager and purchasing agent, becoming general manager in 1899. In 1906 he advanced to the presidency of the road, holding also the position of general manager.

Mitchell D. Rhame, for many years connected with the engineering department of the Chicago, Milwaukee & St. Paul, died at his home in Minneapolis on December 9. Mr. Rhame was born October 12, 1846, at East Rockaway, New York. He graduated from Yale in 1869, and then took a one year post-graduate course at Sheffield Scientific School. Upon leaving school Mr. Rhame entered the service of the United States government as assistant engineer and was assigned to a survey of the Illinois river, with headquarters at Peoria. While at Peoria, W. W. Folwell, president of the University of Minnesota, became interested in him and offered him the position of professor of mathematics and engineering at that institution, which position he held from 1872 to 1880. After severing his connection with the University of Minnesota Mr. Rhame entered the service of the Chicago, Milwaukee & St. Paul as assistant engineer, on March 4, 1881, afterwards holding the titles of division engineer from 1891 to 1905, engineer of construction 1905 to 1908, and district engineer from 1908 to September, 1913, when he resigned on account of ill health. Among the more important works handled by Mr. Rhame during his connection with the railway were the building of the South Minneapolis shops and terminal facilities, the construction of various new lines, the revision and double tracking of the river division from St. Paul to La Crosse, and finally the construction of 200 miles of the Puget Sound line from the Missouri river to the Montana state line near Marmarth.

## Equipment and Supplies.

### LOCOMOTIVE BUILDING.

THE NORTHWESTERN PACIFIC is in the market for 4 eight-wheel passenger and 2 ten-wheel freight locomotives.

THE INTERCOLONIAL is said to have ordered 16 consolidation and 10 switching locomotives from the Canadian Locomotive Company. This item has not been confirmed.

### CAR BUILDING.

THE ERIE has ordered 7 mail cars from the Standard Steel Car Company.

THE ILLINOIS CENTRAL is in the market for 150 express refrigerator cars.

THE UNION PACIFIC is inquiring for 4,000 box, 600 automobile and 400 stock cars.

THE LOUISVILLE & NASHVILLE has ordered 18 all-steel passenger cars from the American Car & Foundry Company.

THE PENNSYLVANIA RAILROAD is said to have ordered 16 combination cars from the American Car & Foundry Company. This item has not been confirmed.

THE GRAND TRUNK is in the market for about 112 passenger cars, as was reported in an unconfirmed item in the *Railway Age Gazette* of December 12.

### IRON AND STEEL.

GENERAL CONDITIONS IN STEEL.—There is still little room for encouragement in the steel industry. Many mills are operating at but 50 per cent. of their capacity, and indications are that they will make the most of the holidays to close down for a while. Such orders as are placed continue to be of a hand to mouth character. The Pennsylvania, which usually places its large order for rails in October or November, has not placed its order even yet this year. The manufacturers are doing their best to maintain prices, and the fact that concessions bring forth no orders encourages them in their policy. The general impression is that many users of steel will have to come into the market before very long out of sheer necessity. It is expected, however, that when the necessary orders are placed that they will be but small and only to cover temporary needs. It is to be noted that the discussion of the fear of foreign competition has died down. It is still a question whether foreign producers will ever be able to compete in this country on a large scale or not. Under present conditions, however, when prices are so low on this side of the water, it seems hardly possible for them to do so.

### SIGNALING.

The Norfolk & Western plans during the coming year to install automatic block signals on 20 miles of its lines, as follows: Suffolk to Myrtle, 6 miles; Windsor to Dwight, 5 miles and Disputanta to Poe, 9 miles.

The Federal Signal Company has taken the contract to install a mechanical interlocking plant for the Philadelphia & Reading at Roelof, Pa. The machine will have 44 levers. Alternating current track circuits will be installed.

The Atchison, Topeka & Santa Fe plans during the year 1914 to install block signals on about 125 miles of lines in addition to lines already worked under the block system. Electric interlocking plants are planned for Wichita, Kan., 80 levers (north tower) and 72 levers (south tower); Joliet, Ill., 224 levers, jointly with the Rock Island, the Michigan Central, and the Alton; Arcadia, Cal., 36 levers; Oakland, Cal., 60 levers. All of these interlockings are at points where other roads have an interest. The Santa Fe is to install a mechanical interlocking, 16 levers, at the bridge at Sibley, Mo.

## Supply Trade News.

The Railway Utility Company, Chicago, has abandoned its branch office in Vancouver, B. C.

The Long Island Railroad, following a recent electric fire on a trestle track at Jamaica Bay, Long Island, has equipped all of its trains with J-M Fyro fire extinguishers. These are manufactured by the H. W. Johns-Manville Company, New York.

Ray C. Lillibridge, Inc., New York, contemplate opening an office in San Francisco next year to take care of the interests of some of their clients in anticipation of the Panama-Pacific Exposition. The New York office, however, will not be abandoned or made subordinate to the new one.

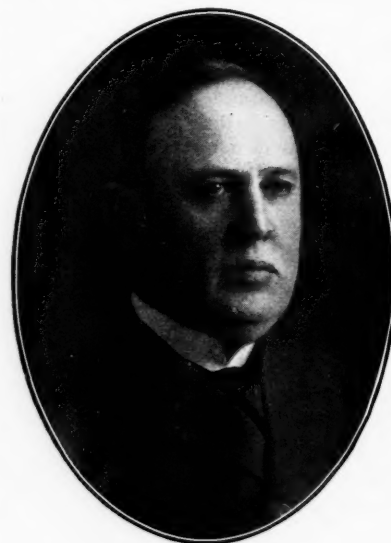
The Ft. Dodge, Des Moines & Southern has for sale two second hand Saxky & Farmer interlocking plants. One is of 16 levers, with 13 working, and the other is of 20 levers with 18 working. Further details and diagrams may be obtained by application to F. M. Johnston, purchasing agent, Boone, Iowa.

The Procter & Gamble Company, Ivorydale, Ohio, has a locomotive for sale. The locomotive has four driving wheels, 50 in. in diameter, and a weight on the drivers of 50,000 lbs. The cylinders are 14 x 22 in., and the steam pressure is 135 lbs. There is also a separate tender with a capacity of 1,200 gals. of water and a ton of coal.

T. A. Griffin, president of the Griffin Wheel Company, Chicago, has been elected chairman of the board of directors, and W. F. Whitcomb, vice-president, has been elected president of the company to succeed him. W. H. Snedaker, local manager of the company's plant at Tacoma, Wash., has been elected a vice-president, with office at Tacoma.

W. W. Butler has incorporated and is president of the W. W. Butler Company, Ltd., of Montreal, P. Q. The new company will engage in the business of selling railway,

marine and mining supplies; it is capitalized at \$100,000, and will have offices in the Transportation building, Montreal. It will represent J. Stone & Company, Ltd., of London, who manufacture complete systems of electric train lighting; the Canadian Gold Car Heating & Lighting Company, Ltd. It will also represent the American Steel Foundries in Canada, and will have the railroad selling agency for the Glidden Varnish Company. Mr. Butler will retain his interest in the Canadian Car & Foundry Company, the Canadian Steel Foundries, Ltd., and the Pratt &



W. W. Butler.

Letchworth Company, Ltd. He has in addition taken a controlling interest in the Dominion Lubricating Oil Company. With him is associated George T. Merwin, who formerly represented the Safety Car Heating & Lighting Company in Canada.

A bankruptcy sale of the assets of the Beaver Dam Malleable Iron Company, Beaver Dam, Pa., will be held at the office of the company at 2 p. m. on January 3. Lawrence Fitch, of Milwaukee, the largest unsecured creditor, has issued a circular letter to the other creditors in which he announces that he and some of the other principal creditors have decided to bid at the sale, and if they buy the property to organize a corporation. Each creditor will be allowed to subscribe to the purchase price, etc., in proportion to the amount of his claim.



Robert Christy Totten, president of the Nickel Chrome Car Wheel Company, Pittsburgh, Pa., died recently. Mr. Totten was born in Pittsburgh on January 6, 1833, and lived in



R. C. Totten.

that city his entire life with the exception of three or four years spent in St. Louis. His father was one of the earliest iron founders in the Pittsburgh region and organized the old Fort Pitt Foundry, which did a great deal of work for the United States Government during the Mexican war in the casting of cannon. At the death of his father, which occurred in 1850, Mr. Totten, then only about 17 years of age, entered the foundry and continued in that business until about 1891. Since that time he had been engaged, to a greater or less degree, in the study of metallurgy, especially in connection with improvements in chilled iron castings. At the time of his death he was engaged in exploiting an invention relating to the addition of nickel and chrome to chill iron for the manufacture of car wheels.

#### TRADE PUBLICATIONS.

**FURNACE SERVICE.**—The W. S. Rockwell Company, New York, has issued a booklet which aims to show what the company can do in way of furnace service for industrial heating operations.

**AUTOMATIC COUPLERS.**—The Durbin Automatic Train Pipe Connector Company, St. Louis, has published a booklet describing the Durbin automatic train pipe connector and illustrating its use.

**DRILLS AND REAMERS.**—The Rich Tool Company, Chicago, has issued a booklet devoted to that company's line of twist drills, reamers, flat drills, etc. As is usual with drill catalogs the booklet is well illustrated and attractive.

**FORGING MACHINES.**—The National Machinery Company, Tiffin, Ohio, has issued a folder describing the National heavy pattern forging machine. This machine includes some radical departures from and improvements over previous types.

**ELECTRIC MOTORS.**—The Sprague Electric Works of the General Electric Company, New York, have devoted bulletin No. 247 to describing that company's line of round type direct current motors, illustrating several ways in which they may be used.

**PLANING MACHINES.**—The Betts Machine Company, Wilmington, Del., has issued a 40-page catalog devoted to Betts planing machines. The booklet contains illustrations of the several machines as set up and ready for service. It aims, also, to give the reader an idea of the size of the work for which each planer is best adapted.

**AIR COMPRESSORS.**—The Ingersoll-Rand Company, New York, has recently issued an attractive booklet entitled, Story of the Imperial. The little catalog aims to show in a rather unique fashion, the superior points of design and construction maintained in the Imperial air compressors. It illustrates to the reader the various stages of construction and gives a concise and elaborate idea of just how the machines are built.

**LOCOMOTIVE LUBRICATORS.**—The Detroit Lubricator Company, of Detroit, Mich., has recently published a 56-page booklet devoted to a description of the Detroit Bullseye Locomotive Lubricator. In it the company illustrates its line of locomotive lubricators, air cylinder lubricators, and other Detroit locomotive specialties. Included, also, are explicit instructions for operation, which enable the reader to make comparisons of an important kind with other machines of like character.

## Railway Construction.

**ALBERTA, PEACE RIVER & EASTERN.**—According to press reports financial arrangements have been made in London, Eng., to build this line. The company was organized to build in Canada from Hudson Bay across the Peace river district to the Pacific coast. H. M. King, vice-president, and H. H. Williams, chief engineer, Edmonton, Alta. (November 8, 1912, p. 906.)

**ALTON & SOUTHERN.**—An officer writes that work is now under way by the List & Gifford Construction Company, Kansas City, Mo., and the Myers Construction Company, St. Louis, building from the present end of track to the Madison county line, two miles. (August 15, p. 313.)

**BIRMINGHAM, ENSLEY & BESSEMER (Electric).**—An officer writes that this company during 1913 built five miles of new lines between the suburbs of Birmingham, Ala. The work was carried out by the Tidewater Construction Company, Birmingham, Ala. Surveys are now being made to complete the line from Birmingham to Bessemer.

**CANADIAN PACIFIC.**—Work is now under way building an extension of the Esquimalt & Nanaimo from Little Jualienne river, B. C., to Courtenay, 36.5 miles. Contracts for the grading and trestle work have been let to Moore & Pettrick, Victoria, B. C., and for the steel bridges to the Canadian Bridge Company, Walkerville, Ont.

**CARY, NORTH & SOUTH.**—An officer writes that work will probably be resumed early next spring on the line from Cochran, Ga., to Cary, 10 miles. Grading work has been finished on seven miles. The plans call for an extension from Cary to Toombsboro, about 29 miles. D. B. Dunn, chief engineer, Macon, Ga.

**CAROLINA & GEORGIA.**—This company, which is building a line from Augusta, Ga., northeast to Columbia, S. C., 75 miles, has amended its charter, it is said, and will build a branch from Johnston northwest to Greenwood, about 40 miles. Both steam and electricity may be used as the motive power. J. U. Jackson, president, Augusta, and F. E. Courtney. (May 2, p. 1013.)

**CENTRAL UTAH.**—Under this name a line is to be built, it is said, from Salina, Utah, east through Salina canyon to coal fields, about 20 miles. Surveys are now being made, and the company expects to have the work under way this winter. W. O. Creer is president.

**CHARLESTON NORTHERN.**—Incorporated in South Carolina to build a 57-mile line from a point on the Georgetown & Western southwest through the counties of Georgetown, Berkeley and Charleston to the city of Charleston, S. C. It is expected that construction work will be started soon, and that the line from Charleston to Andrews will be open for operation in 1914. D. T. McKeithan, president, Darlington, W. R. Bonsal, of Hamlet, N. C., president of the South Carolina Western and the North & South Carolina, is said to be interested.

**ELBERTON & EASTERN.**—An officer of this company, which operates a line from Elberton, Ga., southeast to Tignall, 21.8 miles, writes that in addition to the extension to be built from Tignall east to Lincolnton, 17.5 miles, the company has projected an extension from Tignall south to Washington, 12.5 miles. Alex. W. Wilson, chief engineer, Elberton. (July 4, p. 36.)

**ESQUIMALT & NANAIMO.**—See Canadian Pacific.

**INTERURBAN RAILROAD.**—This company has filed a charter in Louisiana with \$100,000,000 capital, to operate lines in New Orleans and other parishes of Louisiana. The plans call for building from New Orleans west to Kenner, Jefferson parish, thence to St. Charles parish, about 14 miles, and eventually an extension northwest to Baton Rouge, about 90 miles. The directors include C. G. Tinsley, H. G. Dufour, W. C. Dufour, S. Jackson, Charles Janvier, New Orleans, and C. H. Ellis, New Orleans.

**JOLIETTE & LAKE MANUAN COLONIZATION.**—The Canadian parliament is being asked to extend the time for the construction of lines in the province of Quebec from Joliette, northerly to Ste. Emilie de l'Energie and thence north by northwesterly to St. Michels des Saints, and to Lake Manuan, and from Joliette

southerly through the southeastern part of Montcalm county and L'Assomption and Hochelaga counties to Montreal. A contract was let about a year ago to R. J. Craig, Cornwall, Ont., to build the section from Joliette to St. Michels des Saints, about 60 miles. Location surveys were also undertaken for a further 90 miles from St. Michels des Saints to Weymontachene on the National Transcontinental. The general route map for the entire line from Joliette to the National Transcontinental has been approved of by the Canadian Minister of Railways, and a contract has been entered into between the company and the government for the construction of 30 miles of the line, under the act granting aid in the construction of railways. The general contractors are the Enterprise Construction Company, New York and Ottawa. J. N. Patton, Transportation building, Montreal, Que., is chief engineer.

**LYNDHURST LUMBER COMPANY'S LINE.**—An officer writes that the company is building with its own men an extension from Junction, Mill Creek, Va., to North Fork, 10 miles. G. S. Briggs, president, Lipscomb, Va. (See Virginia Roads, May 9, p. 1053.)

**OKLAHOMA ROADS.**—The Sapulpa Commercial Club has under consideration a proposition submitted by former Governor Charles N. Haskell, to build two lines into Sapulpa, Okla. One line is projected from Sapulpa south to a connection with the Missouri, Oklahoma & Gulf at Henryetta, and the other is to be built west to connect with the Santa Fe and the Missouri, Kansas & Texas at Cushing.

**OREGON ELECTRIC.**—An officer writes that during 1913 this company laid 5.8 miles of main track from Orenco, Oregon, to Bowers Spur, and 6.6 miles of second track from Portland to Garden Home.

**PACIFIC ELECTRIC.**—An officer writes that during 1913 this company completed work on 28 miles of new lines, also on 3.77 miles of second track and sidings at various points in California. Construction work is now under way on extensions between Up-land, Cal., and San Bernardino on 23.30 miles; in Riverside on 2.54 miles; from Santa Ana to Orange on 1.64 miles; from Hawthorne to El Segundo, on 4.44 miles, and from Tropic to Glendale, 2.66 miles.

**TEXAS ROADS.**—Plans are being made by residents of Brenham, Tex., and Independence, it is said, to build a line from Brenham northwest to Independence, about 12 miles.

**TRISTATE TRACTION.**—Plans are being made by this company, it is said, to build a line from Burlington, Iowa, southeast to East St. Louis, Ill., about 150 miles. It is understood that construction work will be started early next year at five different points. Steam is to be used as the motive power for freight service and electricity for passenger service. R. O. Marsh, president, Warsaw, Ill.

**WARREN, JOHNSTOWN & SALINE RIVER.**—This company is making surveys for an extension in Arkansas to a point on the Saline river, six miles.

**WASHINGTON ROADS.**—According to press reports residents of Blaine, Wash., will build a railroad from Blaine east to Lynden, 18 miles. Blaine tidelands have been bought for terminals.

**AN ENGLISH RAILWAY SIGNALING SCHOOL.**—On November 3 the London, Brighton & South Coast inaugurated a school for instruction in railway operation and signaling at Croydon. The equipment of the school is very complete. It includes a 47 ft. model of a railway and junction with main and branch lines, a siding and a crossover. This model railway is fully signaled and provided with facing-joint locks, detector bars, indicators as at any similar junction on the railway itself. The signals and connections are all properly interlocked and worked from a full-size 24-lever frame, as in the case of an ordinary signal tower. Two model trains are provided to run on this road, one a passenger and the other a freight. The cars and engines are painted in the usual London, Brighton & South Coast colors. Included in the other apparatus are a complete set of Tyler's block signaling instruments, a set of the more up-to-date Sykes' lock and block signaling apparatus, both of which are in use on the road, and an electric staff system. The object of the school is to enable men to learn signaling and operation without having to go into the regular signal towers.

## Railway Financial News.

**CANADIAN NORTHERN.**—*The Commercial & Financial Chronicle* prints the following as having been authoritatively revised:

"In the legislature at Edmonton quite recently Premier Sifton announced that the government had raised the bond guarantee from \$13,000 to \$15,000 per mile on approximately 600 miles of railway of the Canadian Northern (of which 470 miles was almost complete), located in southern Alberta. The average cost of the line is said to be from \$24,000 to \$30,000 per mile. Bills were also passed guaranteeing the bonds of the Canadian Northern Western line from Blackfalds to the Brazeau coal fields, at \$25,000 per mile for 114 miles (now built, except about 24 miles). The premier stated that the Canadian Northern Western asked for the guarantee of the Brazeau line, which has not hitherto been guaranteed, in order that their capital might be liberated, so that they could proceed with the building of other lines, especially those in the southern portion of the province."

**CHICAGO & EASTERN ILLINOIS.**—The receivers have asked permission of the court to issue \$2,000,000 6 per cent. six months' receivers' certificates. The issue, it is understood, will be brought out by the Equitable Trust Company, and if this plan is carried out there will be outstanding \$6,000,000 receivers' certificates.

**CLEVELAND SHORT LINE.**—The syndicate which bought last September \$5,000,000 Cleveland Short Line first mortgage 50-year 4½ per cent. bonds guaranteed by the Lake Shore & Michigan Southern, and took an option on \$6,800,000 more, has been dissolved, having sold, it is said, \$7,500,000 of the bonds, and the remaining \$4,300,000 bonds have been withdrawn by the company and will not be sold at present.

**DETROIT, TOLEDO & IRONTON.**—The two committees, representing respectively the Northern and Southern divisions, of the Ohio Southern division have agreed on a plan by which the two pieces of property will be operated as one road.

**ILLINOIS CENTRAL.**—Kuhn, Loeb & Co., New York, have bought and are offering to the public \$10,000,000 5 per cent. joint refunding bonds. Of these bonds the bankers are offering \$5,000,000 to investors in the United States at par.

**MISSOURI, OKLAHOMA & GULF.**—On application of the Baldwin Locomotive Works, the company was placed in the hands of a receiver. William Kenefick, president, was made receiver. Oklahoma papers give as the underlying reason for the receivership the recent failure of a Paris bank. There are outstanding \$7,007,000 *Railway* first mortgage bonds, \$1,467,000 *Railway* second mortgage bonds, \$10,655,200 *Railroad* first mortgage bonds, \$350,000 Texas company first mortgage bonds, and \$75,000 Kansas company first mortgage bonds; the Texas and Kansas companies' bonds being deposited under the *Railroad* company's first mortgage bonds.

**ST. LOUIS & SAN FRANCISCO.**—Judge Sanborn, of the United States Circuit Court in charge of the St. Louis & San Francisco receivership, has set a hearing for December 22 at St. Louis for testimony and arguments on the petitions filed on December 9 by stockholders and the receivers of the road for permission to file suits against former officers and directors for restitution of profits alleged to have been made in the sale of subsidiary lines to the Frisco. The petition of the receivers asked instructions from the court as to whether such a suit should be filed.

**WABASH.**—Thomas B. Fauntleroy, special master, has reported to the federal district court that the Wabash is in default principal and interest in the payment of \$44,830,000 and recommends that the trustee for the first refunding and extension mortgage be adjudged to be entitled to a decree providing for the foreclosure sale of the entire property subject to prior liens.

**WABASH-PITTSBURGH TERMINAL.**—On December 18 a conference was held between the two committees representing holders of Wabash-Pittsburgh Terminal first mortgage bonds. Presumably this conference is held in anticipation of an early foreclosure sale.

See also Wabash.